

Kingdom of Cambodia



Ministry of Health

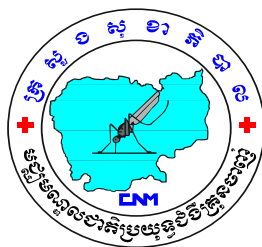


*Strategic Master Plan*

**For**

**National Malaria Control Program**

**2006-2010**



June 2005

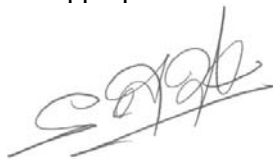
## **F O R E W O R D**

Malaria has been accorded a high priority by the Ministry of Health (MoH), Royal Government of Cambodia (RGC) in view of its heavy toll on human morbidity and mortality in Cambodia. The MoH has therefore been constantly providing policy and programmatic guidance as well as monitoring the actual progress made by the National Malaria Control Program (NMCP). The preparation and documentation of the five year Strategic Master Plan (SMP 2006-2010) is very crucial for the overall direction and practical implementation of the National Malaria Control Program. These plans have been drafted at a critical juncture in the Nation's health history when the health sector reform process is in an advanced stage of implementation, a Sector-Wide Management (SWiM) approach is in place further enhancing the collaboration between the MoH and its partners, decentralization and deconcentration have progressed highly satisfactorily, clearly increasing the empowerment of provincial and operational district health organizations.

The Ministry of Health is extremely pleased to note that the SMP clearly demonstrates the strategic directions, goals, strategies, and policy guidelines for the National Malaria Control Program as well as the resources and activities required for efficiently and effectively implementing the program. The SMP also clearly illustrates the linkages of the malaria program with the overall Health Sector Strategy Plan. This draft plan needs to be further discussed and reviewed at different levels and among different stakeholders and refined as required in the next few months; and updated thereafter on an annual basis, as new strategic lessons emerge and evidence of international best practices become available. The strategic and funding gaps have been clearly articulated, and it is hoped that during the implementation of the SMP, further funds mobilization could take place and the envisaged goal and objectives of the National Malaria Control Program are realized by the end of 2010. The real litmus test for the effectiveness of this SMP will however be its translation into pragmatic operational and work plans at provincial and operational district levels.

I would like to congratulate the Director and staff of the National Center for Parasitology, Entomology and Malaria Control (CNM) for all their earnest efforts in successfully preparing this plan in collaboration with the international consultant supported by USAID, Cambodia.

I would like to express my deep sense of gratitude for all the support lent by esteemed organizations such as World Health Organization (WHO), World Bank (WB), Department for International Development (DFID), United States Agency for International Development (USAID) and Global Fund for HIV/AIDS, TB and Malaria for facilitating this highly relevant and appropriate work.



**Dr. Nuth Sokhom**  
**Minister of Health**

**Phnom Penh, 30 June, 2005**

## **ACKNOWLEDGEMENTS**

It is with a great sense of pride and ownership that the National Malaria Center (CNM) presents its second five-year Strategic Master Plan (MP 2001-2005). The CNM has grown over the years both quantitatively and qualitatively and has won applause not only within the country but also in several international forums. The CNM has been singled out for praise for pursuing very innovative and challenging strategies in Vector Borne and Parasitic Disease Control. This has been largely possible due to the efforts put in by successive leaders who headed the institute over the years, the motivation, commitment and industry exhibited by the staff, the encouragement, support and back-up provided by the Ministry of Health, other Ministries such as the Defense, Interior, Education, Women's Affairs, etc., the co-operation and collaboration extended by valuable partners such as the World Health Organization, World Bank, GFATM, DFID, USAID, GTZ, UNICEF, European Commission, JICA, Internal Federation of the Red Cross, other bilateral agencies and Non-Governmental Organizations, Provincial Health Directorates, as well as the Cambodian population at large who have not only wholeheartedly participated in all our interventions but also encouraged us to seek alternative and more effective interventions and courses of action.

The SMP is the culmination of the direct efforts of the CNM staff over the past few months, with a lot of introspection and forward thinking guiding the whole exercise. These efforts have been facilitated by Dr.V.V.R. Seshu Babu, the consultant contracted by the USAID for this purpose. The Director and staff of CNM would like to place on record our appreciation of the services rendered by this International Consultant.

This work would not have reached fruition without significant contributions from all the key stakeholders involved. We thank them all for their continuous involvement at various stages of the preparation of these plans and their important and significant contributions.

CNM would like to acknowledge the technical assistance support provided by USAID, Cambodia for this work. We also thank WHO, World Bank, DFID, GFATM, PSI, PFD, HU and other partners for their support in the successful formulation of the Plan, which it is hoped would be instrumental in implementing an efficient and effective National Malaria Control Program in Cambodia over the next five years.



**H. E. Dr. Doung Socheat**  
**Director, CNM and Advisor to Ministry of Health**

**Phnom Penh, 30 June, 2005**

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## **Executive Summary**

Malaria with an incidence (treated cases) of 7.5 per 1,000 and 382 deaths in 2004 continues to be a major cause for public health and economic burden in Cambodia and hence malaria control is given high priority by the government and donor agencies. It is currently the third most common cause of outpatients, the fifth main health problem among inpatients and the second most common cause of hospital mortality, despite the limited areas of the country where transmission occurs (forested hilly areas). Although there has been a steady reduction in the severe case fatality rate as well as in the total number of clinically diagnosed and treated malaria cases in the country, during the past few years, yet morbidity and mortality in Cambodia remain unacceptably high and efforts must continue to bring the disease under control. Malaria treatment and control has been hampered by the spread of resistance to common antimalarial drugs. Another compounding problem has been the high prevalence of counterfeit and substandard antimalarial drugs sold across the length and breadth of the country.

The Ministry of Health has founded and designated a specialized institution, the "National Center for Parasitology, Entomology and Malaria Control" formerly referred to as the National Malaria Center (CNM), to develop and execute nation-wide malaria control strategy. CNM has overtime evolved as the nodal department of the Ministry of Health responsible for the control of vector borne diseases. The National Malaria Control Programme is operated through the collaboration between eight departments within CNM and the actual implementation of malaria control activities is integrated into the general health services at the provincial, district and commune level. NGO collaboration is sought and obtained for effective planning, implementation, monitoring and evaluation of the programme.

The National Center for Parasitology, Entomology & Malaria Control (CNM), published its first ever 5-year Strategic plan in 2001. It has since been updating the plan regularly and this second Strategic plan has been more systematically and vigorously developed as compared to the previous one, duly incorporating further strategic lessons learnt through implementation of a decentralized national programme, a series of behavioural and operational research studies as well as international best practices. The NMCP's Strategic Plan for 2006-2010 is an integral part of the Health Sector Strategic Plan 2003-2007 of the Ministry of Health.

The NMCP is committed to pursue the strategic directions of Behaviour Change Communication, Long Lasting Insecticidal Mosquito Nets coverage, Early Diagnosis and Treatment expansion, and capacity building, while building and strengthening its partnerships with international and national organisations including civil society, at the same time mobilising the required human, financial and material resources, during the next five years (2006-2010), in order to reach its strategic goal and strategic objectives by 2010.

Malaria interventions to be delivered during the implementation of the strategic plan are grouped into four packages, with a number of components in each package. The *Prevention Package* will comprise of a Behavior Change Communication Programme and two complementary insecticide treated net services for high and low risk groups. The *Early Diagnosis and Treatment Package* will include interventions through public health facilities, private providers and village malaria workers. The *Research and Surveillance Package* will consist of malaria surveillance, improving quality of health information system and targeted Operational Research. The *Management Package* will include planning, resource management and coordination as well as robust monitoring and evaluation.

CNM and its partners will report on a number of key global, national and provincial level indicators to the Ministry of Health as well as to a wide range of funding agencies such as the GFATM, World Bank, DFID, USAID and others, during the implementation of this plan.

**ACRONYMS**

|           |   |
|-----------|---|
| ACT       | Artemisinin-based combination therapy   |
| ADB       | Asian Development Bank  |
| AIDS      | Acquired immunodeficiency syndrome  |
| A+M       | Artesunate Mefloquine combination (prepackaged & dispensed at public health facilities) |
| ANC       | Antenatal Care  |
| ANE       | Bureau for Asia and the Near East   |
| ARI       | Acute Respiratory Infections  |
| BCC       | Behavior Change Communication   |
| CDC       | Centers for Disease Control and Prevention  |
| CMDG      | Cambodian Millennium Development Goals  |
| CDHS      | Cambodia Demographic and Health Survey  |
| CIDA      | Canadian International Development Agency   |
| CNM       | National Center for Parasitology, Entomology and Malaria Control                        |
| CPA       | Complementary Package of Activities (at referral hospital level)                        |
| CPE       | Cambodian Pharmaceutical Enterprise   |
| DfiD      | Department for International Development  |
| DHF       | Dengue Hemorrhagic Fever  |
| DMS       | (Operational) District Malaria Supervisor   |
| EC – CMCP | European Commission Cambodia Malaria Control Project                                    |
| EDAT      | Early Diagnosis and Treatment   |
| FY        | Fiscal Year   |
| FBC       | Feedback Committee  |
| GDF       | Global Drug Facility  |
| GDP       | Gross Domestic Product  |
| GTZ       | Deutsche Gesellschaft für Technische Zusammenarbeit                                     |
| GFATM     | Global Fund to Fight against AIDS, TB, and Malaria                                      |
| HC        | Health Center   |
| HED       | Health Education Department   |
| HIS       | Health Information System   |
| HIV       | Human immunodeficiency virus  |
| HSR       | Health System Reform  |
| IEC       | Information, Education and Communication  |
| IBN/ITN   | Insecticide-treated Bednet  |
| JICA      | Japan International Cooperation Agency  |
| KAP       | Knowledge, Attitudes and Practices  |
| LLIMN     | Long lasting insecticidal mosquito net  |
| MCH       | Maternal and Child Health   |
| MDR       | Multiple Drug Resistance  |
| M&E       | Monitoring and Evaluation   |
| MIS       | Management Information System   |
| MoH       | Ministry of Health  |
| MoI       | Ministry of the Interior  |
| MoND      | Ministry of National Defense  |
| MPA       | Minimum package of activities   |
| MSF       | Medecins Sans Frontiers   |
| NCHADS    | National Center for HIV/AIDS and Dermatology/STIs                                       |
| NGO       | Non-Governmental Organization   |

***NMCP's Strategic Plan 2006-2010***

|        |  |
|--------|--|
| NMCP   | National Malaria Control Programme                           |
| NSP    | National Strategic Plan                                      |
| OD     | Operational District   |
| OWP    | Overall Work Plan  |
| PHA    | Provincial Health Adviser (provided by either WHO or UNICEF) |
| PHD    | Provincial Health department                                 |
| PMU    | Project Management Unit                                      |
| PSI    | Population Services International                            |
| RDT    | Rapid Diagnostic Test  |
| RGC    | Royal Government of Cambodia                                 |
| RGC    | Royal Government of Cambodia                                 |
| TA     | Technical assistance   |
| TBD    | To Be Determined   |
| UHN    | United Health Network  |
| UN     | United Nations   |
| UNICEF | United Nations Children Fund                                 |
| USAID  | United States Agency for International Development           |
| UK     | United Kingdom   |
| VHSG   | village health support group                                 |
| WB     | World Bank   |
| WHO    | World Health Organization                                    |

## Chapter 1 **Introduction**

### **A. Geography and Demography**

The Kingdom of Cambodia which lies in the centre of the Indo-china peninsula in South eastern Asia has an estimated population of 13.5 million (2004) living in 2.2 million households, in 13,406 villages in 24 provinces including 4 municipalities. The capital, Phnom Penh, has a population of around 1 million; there are only 3 other towns with over 100,000 population: Battambang, Sihanoukville and Siem Reap. The population has been growing at an annual rate of 2.40 percent. The high percentage of women (51.5 percent) and children indicates that meeting their health needs should be a high priority. The population is largely Khmer, with Chinese and Cham minorities, and over 30 ethnic groups inhabiting the mountainous north and northeastern areas.

The total land area is 181,035 sq km. While the population is predominantly rural (81%), population density rates vary widely, from under 12 people per square kilometre in six provinces (Oddar Mean Chey, Stung Treng, Rattanakiri, Preah Vihear, Mondolkiri and Koh Kong) to over 100 per square kilometre in seven (Kampong Cham, Kampot, Kandal, Prey Veng, Sihanouk Ville, Svay Rieng and Takeo); and 3448 in Phnom Penh itself.

The population has been very mobile, in 14 out of the 24 Provinces, more than 30% of the population has migrated from another province; in 4 of the provinces around two-thirds of the population are migrants. Transportation routes from Thailand to Vietnam cross the country; and are about to be dramatically improved with major road construction and renovation programmes.

### **B. Socio-Economic Situation**

The Kingdom of Cambodia enjoyed in the late sixties a higher level of socio-economic development than many other countries in the region. It possessed an effective health system that was able to control the major infectious threats including vector-borne diseases. Three decades of civil war, including the brutal genocide and systematic destruction of infrastructure under the Khmer Rouge regime, created a deficit in Cambodia's economy and left its largely rural population severely deprived. The Paris Peace Accord in 1991 and the UN-brokered elections in the early 1990s signalled a new but tenuous beginning. Cambodia's economy slowed dramatically in 1997 and 1998 due to the regional economic crisis, civil violence, and political infighting, and foreign investment and tourism decreased. In 1999, the first full year of peace in 30 years, the government made progress on economic reforms. Growth resumed and remained about 5% from 2000 to 2004.

Cambodia has a very small manufacturing base at present; exports are mainly raw materials: wood, rice, fish and rubber. Economic growth has been largely driven by expansion in the garment sector and tourism, but is expected to fall in 2005 as growth in the garment sector stalls. With the January 2005 expiration of a WTO Agreement on Textiles and Clothing, Cambodia-based textile producers are in direct competition with lower priced producing countries such as China and India. Faced with the possibility that over the next five years Cambodia may lose orders and some of the 250,000 well-paid jobs the industry provides, Cambodia has committed itself to a policy of continued support for high labor standards in an attempt to maintain favor with buyers. Tourism growth remains strong, with arrivals up by 15% in 2004. The long-term development of the economy after decades of war remains a daunting challenge. The population lacks education and productive skills, particularly in the poverty-ridden countryside, which suffers from an almost total lack of basic infrastructure. Fully 75% of the population remains engaged in subsistence farming. The Cambodian

government continues to work with bilateral and multilateral donors to address the country's many pressing needs. In December 2004, official donors pledged \$504 million in aid for 2005 on the condition that the Cambodian government begins taking steps to address rampant corruption. The next donor pledging session is scheduled for December 2005.

In the past decade, the Cambodian people have made immense progress towards rebuilding their country, but challenges persist: eighty-one percent of the nation's population resides in rural areas with inadequate access to basic services. According to the United Nations Development Program (UNDP)'s 2003 Human Development Index, which measures a country's achievements in life expectancy, educational attainment and adjusted real income, Cambodia ranks 130th out of 173 countries. A cycle of poverty, ill health and debt continues to cripple the country's development. Expenditures for health are a major cause of debt, landlessness and poverty. Cambodians spend a significant portion of their scarce income paying for health care provided by traditional healers, drug sellers and unregistered or untrained pharmacists. Cambodia's extreme poverty situation can be gauged from the following data:

**Table 1: Poverty Indicators in Cambodia**

| <b>Indicator</b>   | <b>Value</b>                                 |
|--|--|
| Poverty ( <i>% of population below national poverty line</i> )               | 36 (2003)                                    |
| Adult literacy rate ( <i>population age 15 and over can read and write</i> ) | 69.4% (2003)<br>Male: 80.8%<br>Female: 59.3% |
| Gross primary enrollment ( <i>% of school-age population</i> )               | 118 (2003)<br>Male: 124<br>Female: 112       |
| Net enrollment in primary school   | 67%  |
| Access to an improved water source ( <i>% of population</i> )                | 30 (2003)                                    |
| GDP ( <i>US\$ billions</i> )   | 4.1 (2003)                                   |
| Gross domestic investment/GDP  | 24.9 (2003)                                  |
| Exports of goods and services/GDP  | 62.2 (2003)                                  |
| Total debt/GDP   | 75.9 (2003)                                  |
| Unemployment rate  | 2.5% (2000 est.)                             |
| Average household monthly expenditure  | US\$104                                      |
| Average household monthly expenditure on health                              | 22% of total household monthly expenditure   |

Source: "Cambodia at a Glance". World Bank website. Date of download: 12 April 2005

The Kingdom of Cambodia, with its rich variety of natural resources (fertile soil favorable for agriculture, good tropical forests, and minerals), and abundant labor force, has the potential for fast economic growth and sustained, rational, and environmentally sound development. The major economic challenge for Cambodia over the next decade will be fashioning an economic environment in which the private sector can create enough jobs to handle Cambodia's demographic imbalance. More than 50% of the population is 20 years or younger.

The Kingdom of Cambodia enjoyed in the late sixties a higher level of socio-economic development than many other countries in the region. It possessed an effective health system that was able to control the major infectious threats including vector-borne diseases. After years of hardship caused by internal turmoil and political instability beginning in the early seventies, the development of health services nose-dived. In fact, no health system

existed during the Khmer Rouge period and the MoH did not receive a budget allocation until 1993. Since political stability has returned in 1997, the MoH has been focusing on defining more appropriate policy and more effective implementing mechanisms. The MoH is currently in the middle of a strategic review policy leading to a more integrated, decentralized system delivering better quality services. And adoption of a sector-wide management approach. Consequently, all departments within the Ministry have been requested to undertake a comprehensive planning exercise leading to the formulation of Five-Year Strategic and Operational Master Plans.

### **C. Health Systems**

There was serious disruption of the Cambodian health system during the 1970s. Civil war between 1970 and 1975 interrupted health service delivery and health personnel education. During the Pol Pot regime, 1975 - 1979, no health system existed and a large proportion of the health workforce (for example, 90% of doctors, 75% of midwives) were killed, died or left the country. Thus, of the 1,000 doctors trained prior to 1975, less than 50 survived the regime. Health facilities were destroyed or fell into disrepair, and supplies and equipment were not maintained. The MoH did not receive a budget allocation until 1993.

In 1979, the restoration of a functioning health care system became one of the highest priorities of the new government of the People's Republic of Kampuchea. The period 1980 to 1989 was one of reconstruction and rehabilitation. In restoring the health system, emphasis was initially given to rapidly rebuilding the health workforce and providing a minimum of health services to the population. Health worker training during this time was mainly theoretical and based on curative concepts. Generally, little clinical experience was gained during training. The health service delivery system was designed as a publicly financed, staffed and managed service, based on a socialist model of health service delivery. But the quality of the services provided was poor. The 1990s have seen a transition from this "emergency" phase of health services development to a "development" phase, with substantial government and donor investment and with increasing emphasis being placed on improving quality of health personnel and services, and responding to the identified health needs of the population. Since political stability has returned in 1997, the MoH has been focusing on defining more appropriate policy and more effective implementing mechanisms. In the 1990s, the government introduced health system reforms to improve and extend primary health care through the implementation of a district health system, which focuses on the distribution of facilities in accordance with a health coverage plan and the allocation of financial resources to provinces. Operational districts are composed of 100 000 to 200 000 people with a referral hospital providing a Comprehensive Package of Activities and health centers delivering primary health care to a target population of 10 000 through a Minimum Package of Activities.

Since the 1996 Health Coverage Plan (HCP) the health system has been divided into three levels: central, provincial and operational district. As of 2001, there were 26 general hospitals, 6 specialized hospitals, 43 district/first level referral hospitals and 768 primary health care centres. Within these public health facilities, there were an estimated 7,634 hospital beds. Utilization of public services on a national scale is low: consultations for curative services in public health facilities is 0.3 new cases per person per year and in 1998, only 23 percent of pregnant women received at least two antenatal consultations. The Government has shown its commitment by increasing the annual budget for health in 1996 and 1999, and the Ministry of Health has developed a budget allocation formula that complements the health coverage plan. In 2000 the Government of Cambodia allocated 9.0 percent of its total budget to health. This proportion is higher than that of its neighbouring governments in Lao People's Democratic Republic and Viet Nam. Nevertheless, the government's contribution is small in actual terms. In 2001, the per capita health expenditure was US\$ 2.84. The health infrastructure is still being developed and the reach of the public

health system remains limited. In 2000, 55 percent of the population had geographic access to primary-level public health facilities, that is, about half the population lived within a 10 kilometer radius or a two-hour walk of a health center. Approximately three-quarters of the primary level facilities receive the drugs necessary to provide a Minimal Package of Activities (MPA). Referral services are still in a stage of development and while 92 percent of the provincial Referral Hospitals (RH) receive the special package of drugs necessary for performing major surgical procedures, only around 30 percent can provide surgical care. The number of hospital beds per thousand inhabitants (0.96) remains low in comparison to neighboring countries, and their distribution nationwide is uneven.

The Cambodian health sector is however seriously fragmented. There is a large and rapidly growing private health sector in Cambodia; however few if any of the institutional prerequisites for efficient markets are in place. As a result, the private sector must be expected to remain uneven in terms of quality of care and equity of access and financing. The public health system is divided into numerous vertical national programs, including those focusing on HIV/AIDS, TB and Malaria, while at the operational level a highly diverse set of non-governmental organisations pursue goals at times parallel to, at times in competition with government priorities. Important economies of scale and of scope are thereby lost, transactions costs elevated, and additional bottlenecks created. The result is weakness of the health system as a whole, as well as unnecessarily high costs for the outcomes attained.

Utilization of public health services on a national scale is very low as most people first seek care in the private sector when ill. According to the *Cambodia Socio-Economic Survey 1999*, the percentage of persons with illnesses who had sought treatment from public health institutions was 24 percent nationally, down from 31 percent in 1997. The increase in private health providers during the inter-survey period presumably contributed to the reported decline. In 1998, about 14 percent of all illnesses or injuries received no treatment, with the rate of non-treatment twice as high among rural inhabitants. The poorest segment of the population is more than four times more likely than the most affluent to forgo treatment altogether. Curative care utilization rates also vary widely among provinces. However, an encouraging trend may be seen in the facilities developed in line with the HCP, which show higher utilization of reproductive health care and immunization activities than other types of primary level public facilities.

Sector-wide Management (SWiM) is being pursued, which has most of the characteristics of a Sector Wide Approach (SWAp), but excludes establishing a mandatory common fund basket and completely adopting common project implementation arrangements. In keeping with the Action Plan for Harmonization and Alignment of the Royal Government of Cambodia (RGC), the SWiM mechanism should be a step towards a SWAp. This would significantly increase opportunities for coordination of efforts and provide flexibility for the allocation of scarce resources while reducing transactions costs in the long run. To this end, a coherent system of planning and implementation processes has been developed in recent years, beginning with the Health Sector Strategic Plan 2003-2007 (HSP), Annual Operational Plans, Joint Annual Performance Reviews, and 3-Year Rolling Plans linked to the Medium Term Expenditure Framework and the Public Investment Program. All of these are joint procedures designed to allow the health sector to draw on the strengths of its constituent parts. They will however require considerable support in the medium term if they are to achieve their desired results. Government health expenditure has been increasing. In 1999 the approximate total government expenditure on health was US\$ 2.85 per capita, increasing to US\$ 3.30 per capita in 2003. Overall health sector financing in Cambodia absorbs approximately 10% of GDP, which is the highest among developing countries in Asia. An estimated 70% of health sector financing is from "out-of-pocket" payments, representing approximately USD 24 per capita, with donors paying approximately two thirds of the remainder. An accurate overall costing for health sector strengthening is not available for Cambodia, however the total cost

for a health sector to be capable of delivering on basic health goals reflected in the Health Sector Strategic Plan, including HIV/AIDS, TB and Malaria goals, has been estimated by the Commission on Macroeconomics and Health to be approximately US 24 Dollars per capita. For Cambodia this would come to approximately 312 Million Dollars annually, including all National Programs, clinical services, pharmaceuticals, administration etc. With total public expenditures on health at about 10 dollars per capita in Cambodia, there will remain an enormous funding gap impeding delivery on overall goals.

In Cambodia, the fight against communicable diseases such as HIV/AIDS, TB and Malaria is being carried out in a context of severe resources constraints, a heavy disease burden, and serious post-conflict institutional challenges. A small informal economy and substantial social development needs mean that national resources available for the three diseases and the health sector in general will remain very limited for the foreseeable future. National health investment is supplemented by substantial international development assistance, however the total funding available remains well below recommended levels for achievement of the Millennium Development Goals. Cambodia's massive loss of educated people in the late 1970's and the disruptions imposed by ensuing years of armed conflict have seriously aggravated human resource constraints, particularly in key age groups for strong management systems. There have been considerable investments in capacity-building in Ministry of Health and specialized institutions, by WHO, DFID and other agencies. At province and district level, a number of non-governmental organizations (NGOs) have played a key role in strengthening quality and capacity for management.

While capacity-building has to a large extent been successful, the system is suffering from a number of fundamental problems: salaries are extremely low, completely incommensurate with living costs; motivation and morale are low, especially for staff working outside Phnom Penh in provinces not supported by a foreign NGO. It is accepted that most staff works half-time or more in the private sector, but there is sometimes not a clear demarcation between public and private resources and facilities. All of these factors militate against decentralization of managerial responsibility, even when the necessary knowledge exists in the periphery.

In most parts of the country, if there is not an NGO supported strong health care facility, most people use private curative facilities rather than public. Whether they choose one or the other, they often end up paying a high price out-of-the pocket for a service of uncertain quality.

Within such a context, it is essential that scarce financial, institutional and human resources be marshaled to maximize effectiveness of interventions against the common communicable diseases and across the health sector.

#### **D. Health Situation**

Poverty, malnutrition and poor or non-existent health services have resulted in some of the worst health conditions in the world (see Table 2). Almost one in ten babies will die prior to his/her first birth-day. Diarrhoeal diseases, acute respiratory infections and low vaccination rates for preventable diseases are the primary causes for almost half of the extremely high under-five mortality rate. Chronic malnutrition among Cambodian children is common, with 45 percent of children moderately stunted and more than one in five severely stunted.

Additionally, levels of micro-nutrient deficiency for iron, vitamin A and iodine are high among children and women. The health status of the Cambodian people is among the lowest in the Western Pacific Region as well as among the Asian Countries. The infant mortality rate was 97 per 1 000 live births in 2003. This is high compared to the estimated mortality rate in the Region for the period 2000-2005, which is only 33.80 per 1 000 live births. The mortality rate

of children under five years of age in 2003 was 140 per 1 000 live births, while the estimated mortality rate of children under five years of age for the period 2000-2005 in the Region is only 39.50 per 1 000 live births.

**Table 2: Demographic and Health Indicators**

|   |                      |
|---|----------------------|
| Total Population <sup>a</sup>   | 13.4 million (2003)  |
| Male: Female ratio <sup>b</sup>   | 93 : 100 (2002)      |
| Age dependency ratio (dependents as a proportion of working-age population) <sup>a</sup>  | 0.8 (2003)           |
| TFR (women age 15-49) <sup>a</sup>  | 3.9 (2003)           |
| Annual Population Growth Rate <sup>a</sup>  | 2.6% (1990-2003)     |
| CPR (married women) <sup>a</sup>  | 23.8%(2003)          |
| Unmet need for contraception <sup>c</sup>   | 32.6%                |
| Population under age 15 <sup>b</sup>  | 42.5%                |
| Life expectancy at birth (male/female) <sup>d</sup>   | 54 / 58 years        |
| Maternal Mortality Ratio <sup>a</sup>   | 450 / 100,000 (2000) |
| Births attended by trained professionals <sup>c</sup>   | 31.8% (2000)         |
| Women receiving antenatal care <sup>c</sup>   | 37.7%                |
| Pregnant women receiving 2+ doses of TT <sup>c</sup>  | 30.0%                |
| Neonatal Mortality Rate <sup>c</sup>  | 37.3 / 1,000         |
| Infant Mortality Rate <sup>a</sup>  | 97/ 1,000(2003)      |
| Under 5 Mortality Rate <sup>a</sup>   | 140/ 1,000 (2003)    |
| Prevalence of child malnutrition--underweight (% of children under age 5) <sup>a</sup>  | 45 (2000)            |
| Child immunization rate, measles (% of ages 12-23 months) <sup>a</sup>  | 65 (2003)            |
| Adult population with HIV/AIDS <sup>e</sup>   | 2.60%(2002)          |
| Health expenditure per capita (\$) <sup>a</sup>   | 32.0 (2002)          |
| Physicians (per 1,000 people) <sup>a</sup>  | 0.2                  |
| Hospital beds (per 1,000 people) <sup>a</sup>   | 2.1                  |
| <b>Sources:</b> <sup>a</sup> HNPSStats - the World Bank's Health, Nutrition and Population data platform<br><sup>b</sup> US Census Bureau, 2002 International Database<br><sup>c</sup> National Institute of Statistics, Directorate General for Health (Cambodia) and ORC Macro, 2000 Cambodia Demographic and Health Survey<br><sup>d</sup> Population Reference Bureau, 2003 World Population Wall Chart<br><sup>e</sup> NCHADS, 2002 HIV Sentinel Surveillance (HSS) survey |                      |

Cambodia continues to face serious burden of communicable diseases including HIV/AIDS, TB and Malaria epidemics, as well as a high burden of disease in general. With an incidence (treated cases) of 7.5 per 1,000 and 382 deaths in 2004, Malaria poses a considerable burden of mortality and morbidity in certain remote geographical areas and during certain periods of time. Cambodia is ranked among the 22 high TB burden countries of the world. In 2002, WHO estimated that the incidence of all forms of tuberculosis as 549 per 100,000. Cambodia's case detection rate under DOTS was 60% in 2003, the cure rate exceeding 90%. The prevalence of HIV infection among adults in Cambodia appears to have leveled out over the last few years, indicating 1.9% in 2003, still the highest prevalence in the region affecting 123,000 people. The HIV/AIDS epidemic in Cambodia threatens to undermine successes that could be achieved through other development efforts in economic growth and the reduction of morbidity and mortality.

Each of the target disease specific efforts are reflected in the National Strategic Development Plan 2006-2010, which guides Cambodia's progress towards the Cambodian Millennium Development Goals (CMDG). Key health CMDG's include:

- Reducing under-five mortality rate to 65 per 1,000 live births
- Reducing infant mortality rate to 50 per 1,000 live births

### ***NMCP's Strategic Plan 2006-2010***

- Reducing maternal mortality to 140 per 100,000 live births
- Reducing HIV prevalence to 1.8%
- Decreasing malaria and dengue cases treated in the public health sector to 4.0 and 0.4 per 1,000 population, respectively
- Decreasing smear-positive TB rate to 135 per 100,000 population
- Increasing proportions of rural and urban populations with access to safe water sources to 50% and 80%, respectively
- Increasing proportions of rural and urban populations with access to improved sanitation to 30% and 74%, respectively

Cambodia appears to be on track for HIV, TB, Dengue, Malaria, Water and Sanitation. However, a sobering indication of the continuing gaps between successful vertical initiatives is provided by the fact that Mother and Child Health remains seriously off-track.

The control of malaria and other vector borne diseases has been accorded a very high priority by the MoH. The burden of diseases such as malaria, dengue and schistosomiasis is very high and rising worldwide; they remain a major threat in Cambodia. Important regional differences exist as regards the patterns and consequences of malaria and other vector borne diseases in this country. They result in short-term economic losses and hinder long-term economic growth as the burden of the disease increases over time. This dimension cannot be overlooked in a country struggling with under-development. Modern and cost-effective methods of control exist. Their implementation is a major challenge in a country such as Cambodia. This document presents the Strategic Plan for the next five years developed and refined at CNM, the institution charged with the responsibility of planning, implementing, monitoring and evaluating the National Malaria Control Program.

## Chapter 2

### *The National Malaria Control Program*

#### **A. Introduction**

The National Malaria Program is *“a vertical programme led by the National Malaria Center (CNM) in Phnom Penh, but is decentralized administratively with responsibility for activities assigned to provincial and district health departments.”*

#### **B. Historical Perspective**

Malaria control activities began in Cambodia in 1951, and before the disruptions of the 1970's developed a programme of epidemiology, treatment and vector control, with a dedicated staff of more than 400 and a solid infrastructure of transport and communication. In 1979, at the end of the infamous Khmer Rouge regime, only 10 persons from the former malaria programme were available to restart activities in the rubber plantations of Kampong Cham province. In 1984 the National Malaria Center was formally established as an institute within the Ministry of Health to provide technical and material support to malaria treatment facilities in provincial and district hospitals. Throughout the 1980s the programme struggled with extremely limited resources to treat the large number of cases among persons working in the defense forces along the Thai border. It was not until the early 1990s that logistical support for malaria diagnosis and treatment became integrated with the national essential drugs programme and the Malaria Center could begin a transition from purely hospital-based curative activities to more pro-active community based health education, evaluation and control activities. The National Malaria Center was reorganized in November/December 1995 with added responsibilities for schistosomiasis and dengue control activities. Subsequently filariasis elimination programme was added to its remit.

#### **C. Structure**

Malaria is a complex and priority public health problem for the Kingdom of Cambodia. Therefore, the Ministry of Health has founded and designated a specialized institution, the National Malaria Center (CNM), to develop and execute nation-wide malaria control strategy. The National Malaria Center (CNM) has overtime evolved as the nodal department of the Ministry of Health responsible for the control of vector borne diseases. This includes investigation, training and supervision of health staff and other interventions. CNM co-ordinates four main programmes: Malaria, Dengue Hemorrhagic Fever (DHF), Filariasis and Schistosomiasis and intestinal parasitic infections. The National Malaria Center is in reality a misnomer since it also includes the Filariasis elimination, Dengue control, Intestinal Helminthiasis, and Schistosomiasis Control Programmes. The Ministry of Health therefore recently changed the official name of the institution to “National Center for Parasitology, Entomology and Malaria Control”.

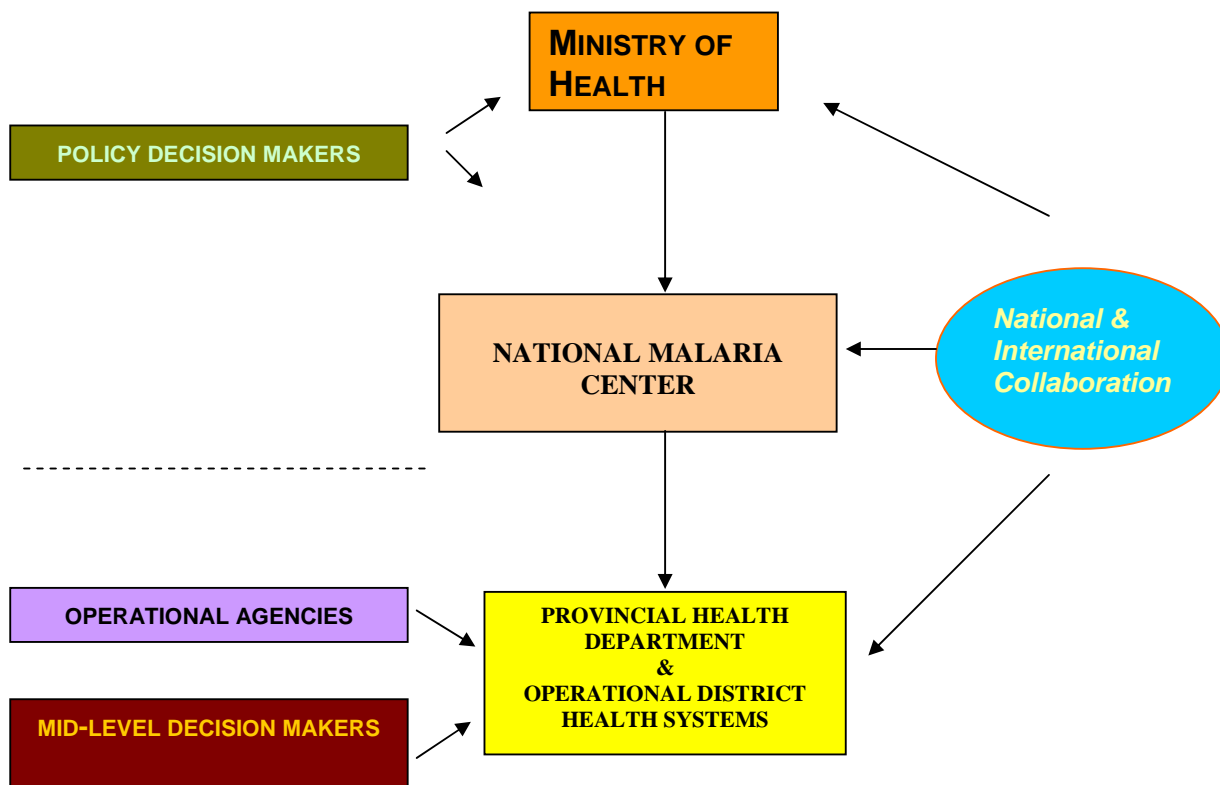
The Malaria Control Programme is operated through the collaboration between eight departments within CNM:

1. Health Education
2. Technical Bureau (oversees Treatment, Training and Supervision)
3. Laboratory Department (oversees Diagnostics)
4. Insecticide-treated Bed nets (ITN) Department (involved in ITNs and LLIMNs)
5. Epidemiology (involved in Malaria Surveillance, Health Information System relating to malaria information, and Operational Research)
6. Entomology Department (Operational Research related to ITNs, LLIMNs, Vector Bionomics, etc.)

7. Procurement Department (involved in the direct and indirect procurement of all drugs, commodities, equipment and goods required for the effective implementation of the programme)
8. Administration and Finance Department (involved in administrative, financial and logistics issues related to the NMCP)

The actual implementation of malaria control programme activities is integrated (see Figure 1) into the general health services at the provincial, district and commune level. NGO collaboration is sought and obtained for effective planning, implementation, monitoring and evaluation of the programme. The entire general health system was recently reorganized under a new Health Coverage Plan. Each Province has a "Provincial Malaria Supervisor (PMS)" who may have additional responsibilities such as dengue and other communicable diseases in addition to malaria. Although there are some "District Malaria Supervisors" in some of the endemic districts, most district "malaria staff" are multi-functional. There is no specialized malaria staff at the commune level.

**Figure 1: Structure of the National Malaria Control Program**



#### **D. Functions of CNM in relation to malaria control**

CNM's major functions related to malaria control are:

1. Provide technical assistance to the MoH for determining objectives and effective national strategy and advise the MOH on national malaria policies.
2. Plan, organize and develop malaria control activities at all levels.

3. Train and supervise central and peripheral staff in the implementation of all malaria control activities.
4. Monitor and evaluate malaria control activities through routine data collected through Health Information System, monitoring and supervision visits, special surveys and operational research.
5. Analyze health information related to malaria, and apply it for timely and effective malaria control in the country.
6. Undertake training needs assessment, design appropriate curricula, develop and test training manuals and materials and organize training at different levels in the health system
7. Periodically assess behaviour change communications needs relating to the malaria programme and develop, replicate and disseminate health education materials and organize community mobilization campaigns.
8. Assess the numbers and types of population at risk, plan and distribute insecticide treated bed nets (ITNs)/long lasting insecticidal mosquito nets (LLIMNs), ensure annual retreatment of ITNs/ replacement of LLIMNs every three years and monitor regular use by the community as well as insecticidal resistance.
9. Determine drug, reagent and material needs, procure directly/indirectly all needed supplies and supervise distribution.
10. Ensure that all health personnel who handle malaria cases, whether in the public health facilities or in the private health sector, adhere to national malaria diagnosis and treatment guidelines, through training, follow-up, monitoring and mentoring activities.
11. Carry out quality control of blood slides and dipsticks collected from the provinces on a monthly basis.
12. Coordinate malaria control activities of other organizations.

#### **E. Decentralized Responsibilities of the PHDs for Malaria Control**

- Assessment of malaria situation in the province
- Planning of all malaria control activities in the province
- Organizing Training Courses for different personnel
- Distribution & retreatment/replacement of ITNs/LLIMNs
- Assistance with social marketing of insecticide-treated hammock-nets, Malacheck and Malarine products
- Distribution of dipsticks, microscopes, reagents, antimalarials, etc
- IEC Material distribution & IEC campaigns
- Collection of Health Information on Malaria
- Participation in Operational Research Studies of CNM
- Supervision of ODs/Referral hospitals/Health Centers
- Participation in Border Malaria Meetings and Follow-up actions

#### **F. Goal of the National Malaria Control Programme**

To reduce malaria related mortality by 50% and morbidity by 30%, among the general population in the Kingdom of Cambodia within five years through the implementation of a comprehensive national malaria control strategy

#### **G. Objectives of the National Malaria Control Programme**

The National Malaria Control Programme has 4 main objectives:

1. To significantly increase community awareness and care-taking practices on malaria prevention and control with promotion of proper health seeking behavior in malaria endemic areas in Cambodia.

2. To improve access to preventive measures that protect the population at risk, with a focus on complete coverage for bed net distribution and re-treatment in targeted malaria endemic areas, employing an effective community based approach.
3. To increase access to early diagnosis and treatment (EDAT) for malaria throughout the country by making dipstick diagnosis and pre-packaged combination therapy available everywhere by means of a three pronged approach involving: conventional public sector channels; emergency EDAT delivered through a network of village malaria workers in the most remote and inaccessible malaria hotspots; and socially marketed products distributed through the private sector.
4. To strengthen the institutional capacity of the national malaria control program at central, provincial, operational district and commune levels

## **National Malaria Center**

### ***Structure***

The National Center for Parasitology, Entomology and Malaria Control, formerly called the National Malaria Center (CNM), is a specialized institution set up by the Ministry of Health, to function as the nodal department responsible for the control of vector borne diseases in Cambodia. According to the organogram (See Annex 1), the CNM is organized into four programmes with a shared administration, Planning Committee and Director. Further restructuring is in process, and it is expected that the institution will soon have the services of more Vice Directors in order to strengthen the management of the different national programmes operated by the Center.

### ***Functions***

The National Malaria Center (CNM) is one of the health institutions of various institutions under the Ministry of Health, which is responsible for the control of vector-borne diseases. It co-ordinates four main programs: malarial, dengue haemorrhagic fever (DHF). Schistosomiasis (plus other intestinal parasitic infections) and filariasis. Its role as the apex center of reference and operational research is envisaged to be developed in the years to come. The main functions of the National Malaria Center are:

- a) To provide technical assistance to the MoH for determining objectives and effective national strategy
- b) To strengthen the institutional capacity at all levels,
- c) To support the health system network for providing access to the population and to supervise program activities,
- d) To define effective policy interventions,
- e) To monitor and evaluate the program interventions,
- f) To carry out operational research
- g) To collaborate with national and international partners and donors.

### ***Vision Statement***

CNM envisages a country where people live in a clean environment, adopt healthy lifestyles including practices that discourage mosquitoes and other vectors from causing a nuisance- such as sleeping under treated bed nets; where there may be vectors but no vector-borne diseases such as malaria, dengue and filariasis exist, and even if cases do occur sporadically, they are promptly diagnosed and effectively treated.

### ***Mission Statement***

It is our commitment to continuously empower through operational research, training and capacity development, all those involved in vector control at different levels in the country

both in the public and private sectors, in relentlessly undertaking all possible and appropriate actions in order to ultimately eliminate and eradicate vector borne diseases in the country.

***CNM's Goal***

To serve as an efficient and effective apex center of excellence for ultimately eliminating and eradicating from the country the common vector borne diseases.

***Overall Aim of the CNM***

To contribute to the improvement of the health status of the population of Cambodia through reduction in the morbidity and mortality of malaria dengue fever, schistosomiasis, and other helminthes, and elimination of filariasis.

***Objectives***

1. To operate flexible enhanced programs that can deliver effective vector borne disease control within identified time spans.
2. To continuously keep a vigilant watch on the vector borne disease situation in the country and make appropriate policy, program and operational recommendations from time to time.
3. To carry out operational research studies the outcomes of which will directly feed back into program enhancement.
4. To contribute to the continuous capacity-building of all the institutions and personnel involved in vector borne disease control at all levels in the country.
5. To mobilize in time all the required resources including financial from all possible sources, national and international in order to control the vector borne diseases in the country.

## Chapter 3

### Malaria Situation in Cambodia

#### A. Magnitude of the Problem

Malaria continues to be a leading cause of mortality and morbidity in the Kingdom of Cambodia, and malaria control is given high priority by the government and donor agencies. There are no nationally representative data on the incidence of malaria or burden of disease estimates. A recent Joint Health Sector Review noted that the production of Burden of Disease estimates would be a costly undertaking in Cambodia. According to the most recent estimates (the National Health Survey, 1998), however, 13.5 per cent of the surveyed population had been either sick or injured and required clinical care in previous 30 days. A nation-wide malaria baseline study<sup>1</sup> including a prevalence survey has been conducted in the latter half of 2004 and according to the draft report, the prevalence ranged from 0.2% to 6.9% in different geographical domains with an overall average of 2.7%. The prevalence ranged from 1.4% in risk zone category 3 (villages located at 1 to 2km from forest) to 3.4% in category 1 (within 250metres from forest). However, it must be borne in mind that the CMBS 2004 did not measure overall malaria burden in Cambodia, since the survey sampled preferentially in higher risk areas. Currently, the main source of disease incidence estimates is the National Health Statistics Report (NHSR) 2003<sup>2</sup>. This report only provides information about people visiting a public health facility. This is a self-selected group that only accounts for 20 per cent of those in need of health services. According to NHSR 2003, malaria is currently the third most common cause of outpatient attendance (accounting for 2.37% of outpatients in 2003), the fifth main health problem among inpatients (accounting for 4.17% of inpatients in 2003) and the second most common cause of hospital mortality (accounting for 9.51% of all hospital deaths), despite the limited areas of the country where transmission occurs (forested hilly areas).

#### Box 1: Magnitude of Malaria in Cambodia

- Case fatality rate is higher in Cambodia than in the neighboring countries. About 400 people (0.5%) die each year due to malaria in Cambodia. 80% of the deaths are attributable to *Plasmodium Falciparum*.
- *P. falciparum* accounts for 82% of the positive slides in 2000 while the remaining are *P. vivax* (16%) and mixed infections (2%). Multi-drug resistant *falciparum* strains are widely spread especially in the western provinces.
- Anthropogenic changes such as deforestation, road-construction and agricultural development increase the intensity of its transmission.
- The worst affected are the ethnic minorities, temporary migrants, settlers in forested areas, plantation workers and other who live in the country's hilly forested environments and forest fringe along the border areas with Laos, Thailand and Vietnam.

The malaria mortality rate in 2004 was 2.8 per 100,000 population. When the numbers of officially recorded deaths in the year 2002 are compared, there were twice as many deaths recorded in Cambodia as compared to neighbouring Laos, 4 times more malaria deaths reported than in Thailand and 9 times more than in Vietnam. It is also a key contributor to anaemia, complications during pregnancy, low-birth weight and poor child growth. Multi-drug resistant (MDR) strains of *falciparum* are widespread. Malaria in Cambodia imposes economic costs, which include direct medical costs (for treatment), foregone wages as well

<sup>1</sup> NIPH and Malaria Consortium: Draft report on malaria baseline survey in Cambodia. April 2005.

<sup>2</sup> Department of Planning and Health Information: "National Health Statistics Report, 2003". Ministry of Health, Royal Government of Cambodia, August 2004

as broad social costs such as schooling, demography, migration and saving. Macroeconomic costs include the impact of malaria on trade, tourism and foreign direct investment.

According to the Annual Report of CNM<sup>3</sup> for the year 2004, a total of 101,857 people were treated for malaria by the public health services and village malaria workers during 2004. 59745 (58.65%) of these cases were confirmed either through the use of microscopy (62.58%) or rapid diagnostic tests (37.42%). 82.9% of these confirmed cases were falciparum malaria and of these 3,719 cases were classified as severe. 382 deaths were reported giving a falciparum case fatality rate of 0.74% and a severe case fatality rate of 10.3%. A cross-sectional survey of community drug practices (supported by MSH/WHO/USAID)<sup>4</sup> carried out in October 2002 in four Cambodian provinces along the Cambodia-Thai border revealed that more than 80% patients seek treatment other than at the public health facilities. Similar findings were reported by PSI<sup>5</sup> when they carried out their willingness to pay study in December 2003 (79% sought treatment for malaria from pharmacies and private practitioners as against a mere 17% who visited HCs and hospitals). These findings reaffirmed the previously held evidence and belief that around 80% of civilian cases are treated in the private sector and unfortunately no systematically collected data are available for this group. What proportion of this 80% can be accounted for by repeat visits resulting from therapeutic failures (because of inappropriate treatments) is unclear. CNM undertook a pilot project with GTZ BACKUP Initiative support to train private providers in malaria diagnosis, treatment (according to national guidelines) and record keeping and to evolve a strategy for the collection, compilation and analysis of malaria related information from the private sector in 4 selected provinces in order to provide strategic recommendations for incorporation into the national malaria control program, and ultimately scaling up the implementation nation-wide with possible Round 5 GFATM support<sup>6</sup>. A total of 9356 cases were recorded in the 4 project provinces by the 199 PPs, who were trained and followed up under the project. From the findings presented in Table 3, although there are great inter-provincial differences, it may be overall inferred that the crude ratio of malaria cases in the public and private sector is approximately 1:2 (i.e. *at least twice* the number of cases reported in the public health sector, appear to be seeking treatment from the private sector).

**Table 3: Crude Comparison of Malaria Cases Recorded in Public and Private Sectors in 4 GTZ project provinces (June-December 2004)**

| <b>Name of Province</b> | <b>No of cases recorded in all Public Health facilities in the project provinces</b> | <b>No. of cases recorded by project PPs</b> | <b>Approximate proportion of PPs covered by the project in the entire province</b> | <b>Extrapolated malaria cases in entire Private Sector in the entire province</b> | <b>Total estimated malaria cases in the entire province</b> |
|-------------------------|--|---|--|---|---|
| <i>Pailin</i>           | 6169   | 2164  | 37.84%   | 5719  | 11888   |
| <i>Pursat</i>           | 5250   | 2256  | 30.00%   | 7520  | 12770   |
| <i>Kampot</i>           | 3042   | 2583  | 18.33%   | 14089   | 17131   |
| <i>Stung Treng</i>      | 2166   | 2353  | 40.91%   | 5752  | 7918  |
| <b>Total</b>            | <b>16627</b>   | <b>9356</b>                                 | <b>27.99%</b>  | <b>33428</b>  | <b>50055</b>  |

3 National Center for Parasitology, Entomology and Malaria Control (CNM): Annual Report for 2004. Ministry of Health, Cambodia. March 2005

4 RPM Plus, MSH: Community drug use practices in malaria in Cambodia: a cross-sectional study, February 2003

5 PSI/Cambodia: Willingness to Pay Survey for antimalarial drugs. December 2003

6 National Center for Parasitology, Entomology and Malaria Control (CNM): Final Report on Pilot Project for Private Sector Malaria Information Strategy. May 2005. Ministry of Health, Cambodia. March 2005

Military sources suggest that 21,357 clinically diagnosed cases were treated in army health facilities in 2004 and 5 soldiers died from the disease. On the basis of all these figures, CNM estimates that at least 300,000 new cases of falciparum malaria were treated in Cambodia in 2004. There may be another 100,000 cases a year going completely untreated in deep forest communities. It is not possible to guess at the number of resulting deaths with any accuracy but it is clear that the reported number is a gross underestimate. A factor that contributes to this under-reporting is that in Cambodia it is common practice for very sick patients to be taken away from health facilities to die at home.

## B. Malaria Epidemiology in Cambodia

### 1. Age-sex distribution

Table 4 shows that according to the HIS (from public health facilities) malaria is predominantly observed in males aged 15-49 years (49.3%) followed by females aged 15-49 years (19.8%). The next commonly affected age group comprises of those aged 5-14 years (15.6%).

The CMBS 2004 revealed male preponderance in malaria prevalence (3.8% in males and 1.9% in females). Prevalence was found to be 3.0% among the 0-4 years age group, 3.1% among the 5-14 years age group and 2.5% among those aged 15 years and above.

| Table 4: Malaria confirmed cases by age group in 2004 |      |      |       |        |      |        |       |
|---|------|------|-------|--------|------|--------|-------|
|   | 0-4  | 5-14 | 15-49 |        | >49  |        | Total |
|   |      |      | Male  | Female | Male | Female |       |
| Number  | 4269 | 9122 | 28836 | 11620  | 3031 | 1670   | 58548 |
| %   | 7.3  | 15.6 | 49.3  | 19.8   | 5.2  | 2.9    |       |

### 2. Parasites

Two main species of parasite *Plasmodium Vivax* and *P. falciparum* are incriminated. Multi-drug resistant falciparum strains are widely spread especially in the western provinces. *Plasmodium falciparum* 82%, *P.vivax* nearly 16%, *Mixed infection* 2%; by blood slide examination. *P. malariae* and *P.ovale* are uncommon, although Pasteur Institute of Cambodia demonstrated some during a recent cross-sectional survey and a few were found during the microscopic examination of the slides collected during the recent CMBS 2004.

### 3. Vectors

Although several malaria vectors are reported, there are five main species of *Anopheles* vectors in Cambodia. *Anopheles dirus* and *An. minimus* are considered to be the major vectors in Cambodia while *An. aconitus* and *An. maculatus* are considered as secondary vectors. *An. sundaicus* is a vector in coastal areas (Table 5 summarizes their bionomics). The primary ones, *Anopheles dirus* and *An. minimus*, are not normally found in the heavily populated rice growing areas of Central and Southeast Cambodia. The main vector *An. dirus* and to a lesser extent, *An. minimus* are difficult to control.

**Table 5: Major vectors of Cambodia, breeding places, biting and resting habits<sup>7</sup>**

| Vector               | Breeding places  | Biting habits  | Resting habits                                   |
|----------------------|--|--|--|
| <i>An. dirus</i>     | Small water collections, footprints of animals, wheel-tracks, burrow-pits, usually in thick forest or forest fringe with heavy shade and high humidity | Exophagic (bites outdoors), highly anthropophilic  | Exophilic (rests outdoors after feeding)         |
| <i>An. minimus</i>   | Edges of flowing waters such as foothill streams, and springs. Prefer shaded areas of sunlit habitats.   | Endophagic (bites indoors) as well as exophagic (bites outdoors), and anthropophilic, but frequently show zoophily) found to bite cattle more frequently than <i>An. dirus</i> | Mainly endophilic (rests indoors after feeding). |
| <i>An. Aconitus</i>  | Rice fields, swamps, irrigation ditches, pools and streams with vegetation and prefer sunlit habitats.   | Exophagic and endophagic, anthropophilic and zoophilic   | Exophilic and endophilic                         |
| <i>An. Maculatus</i> | In or near hilly areas, in seepage waters, edges of ponds, ditches, rice fields, and prefers sunlight.   | Exophagic and endophagic, equally zoophilic and anthropophilic   | Exophilic and endophilic                         |
| <i>An. Sundaicus</i> | Salt and brackish waters, lagoons, marshes, pools and seepages.  | Exophagic as well as endophagic. More anthropophilic than zoophilic.   | Exophilic and endophilic                         |

#### **4. Environmental Factors and Areas of Transmission**

The climate of Cambodia is tropical with little seasonal temperature variation, the monsoon season is from May to November and the dry season from December to April. The terrain is that of mostly low, flat plains with mountains in the north and southwest. Malaria in Cambodia is associated with forest, forest fringe areas and the rubber plantations. Transmission is high and seasonal, in the forest and forest fringe areas of the north, west and northeast, and also in the rubber plantations of the east and northeast. In the rice growing areas of the south and central regions, transmission is low or non-existent. There is no transmission in urban areas. Low intensity transmission is found focally in coastal areas. 60% of the land mass comprises of thinly populated, forested and hilly areas related to the characteristics of vector habitats, with high malaria transmission but with difficult or no access to the public health system.

In principle, the social factors related to malaria and its control are closely related to the epidemiological ones, and in general, the most coherent problem analysis derives from an

<sup>7</sup> Personal communication from Dr. Tho Sochantha, Dy. Chief of Technical Bureau and I/C of Entomology Dept., CNM

understanding of malaria as a system, where parasites, vectors and humans interact under the influence of environmental and other contextual factors.

### **5. Population at Risk**

85% of the population lives in rural or urban areas without malaria transmission but around 15% (approximately 2 million) either live permanently in the forested endemic areas or are "forest dependant" for additional income besides rice farming.

### **6. Risk zones, risk groups and underlying factors**

In principle, the social factors related to malaria and its control are closely related to the epidemiological ones, and in general, the most coherent problem analysis derives from an understanding of malaria as a system, where parasites, vectors and humans interact under the influence of environmental and other contextual factors.

Cambodia has a total area of 181,035km<sup>2</sup> and a population of 13.5 million (2004 Population Projection by Ministry of Planning<sup>8</sup>). Malaria transmission in Cambodia is very focal, and in most locations is also unstable, with considerable inter-annual variation in transmission intensity. For this reason, accurate targeting to the populations most at risk is a key determinant of the effectiveness of vector control. In Cambodia, targeting has been based on the system of stratification, which in turn is based on the proximity of each community to the forest. In the absence of reliable epidemiological data, proximity to forest is likely to be the best available indicator of risk, and for practical purposes, this simple system has served the NMCP very well. Figures have been readily available on the size of the resident population in each stratum, and these figures have turned out to be essential for operational planning at national and local level. However, there has been no concerted and consistent attempt to verify the system using epidemiological data. It has been assumed that the incidence in risk category zone 1 is greater than that in risk category zone 2, which in turn is greater than that in risk category zone 3, but this has apparently been not checked. Similarly, it is not clearly known what proportion of all malaria cases arise from risk category zone 1, and what proportion from risk category zone 2, etc. This would be useful planning information<sup>9</sup>. Routine health facility data did not prove to be suitable for this purpose.

#### ***Redefined Risk Zones***

Currently the CNM uses four risk zones or categories (referred to as CNM risk zones here) for determining its malaria control strategy. They all lie within one kilometer of the forest (Figure 2 and Table 6).

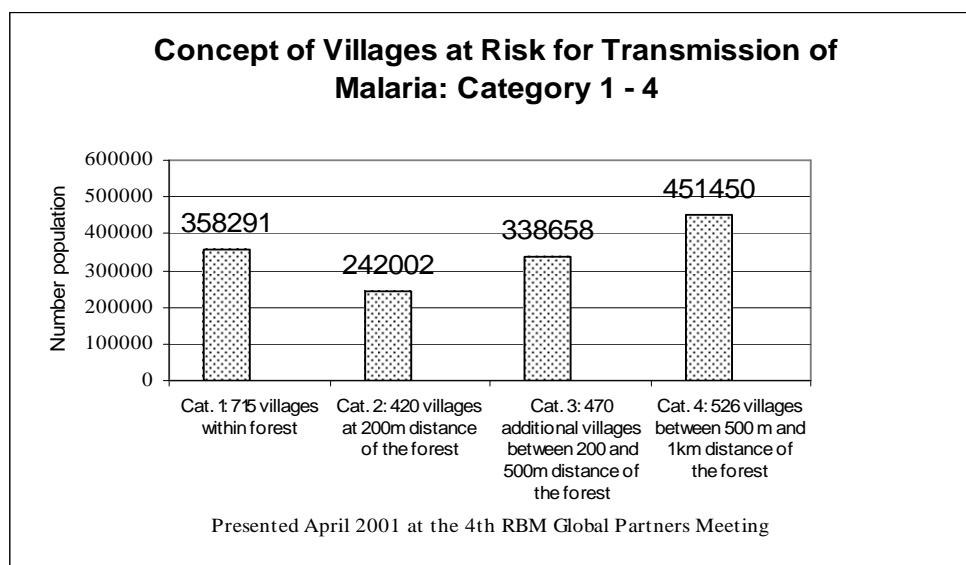
The villages within each zone were listed by CNM in 2001 based on expert opinion and updated in 2005 to account for change in forest cover. ITN distribution programmes have been targeted at CNM zones 1 and 2, and villages in these zones were also selected to pilot the Village Malaria Worker (VMW) scheme. In order that the baseline survey could ascertain if indeed the risk of malaria transmission is almost completely confined to within one kilometer of forest, sampling included a new risk zone of one to two kilometers from the forest for comparison with villages within one kilometer of forest. Since intervention strategy is not different in current zone 1 from zone 2 and current zone 3 from zone 4 the CMBS combined current zones 1 and 2 to a new zone 1 and current zones 3 and 4 to a new zone 2.

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8 DPHI: Population Projection 1998-2020 by the Ministry of Planning, July 2003, with technical assistance from Dr. Ricardo F. Neupert, /Senior Researcher at CPS-RUPP/UNFPA

9 Lines, J: Draft report following mission to review hammock net intervention in Cambodia. November 2003

Figure 2: CNM risk zones<sup>10</sup>



**Table 6: Risk zone definitions**

| CNM Risk Zones                | Redefined (CMBS) Risk Zones              |
|-------------------------------|--|
| 1. In forest                  | 1. In forest and up to 250 m from forest |
| 2. Less than 200m from forest |  |
| 3. 200-500 m from forest      | 2. 250m – 1 km from forest               |
| 4. 500 m- 1 km from forest    |  |
| (5. Greater than 1 km)        | 3. 1-2 km from forest                    |

The data from CMBS 2004 revealed that there is considerable evidence of malaria transmission in the zone from 1 to 2 km from the nearest forest. The risk is less than for those closer to the forest, but indicates the need for the control program to include this zone in its control strategies. The CMBS 2004 has also pointed out that certain remote sensing – based approaches appear to have good potential for risk mapping and should be further explored.

#### *Risk Groups:*

Thick forests and jungle cover sixty-two per cent of its landmass and these areas provide ideal breeding sites for *Anopheles dirus*, the principal vector mosquito. An estimated 2 million people are at risk of malaria and 500,000 of these live in the high transmission forest areas. These areas are sparsely populated with an average of just 5 inhabitants per square kilometer (compared to 132 inhabitants per square kilometer in non-malarious central areas of the country). The epidemiology of malaria varies in different parts of the country. The most highly endemic areas are the borders with Thailand, Laos and Vietnam. Border areas are hyperendemic to mesoendemic, whereas there is little or no transmission in Phnom Penh and the area around Tonle Sap. Most malaria cases in the south and central regions are imported from the forest areas on the borders. There are six main categories of people affected: ethnic minority groups, forest fringe inhabitants, temporary migrants, organized groups, refugees & displaced persons and new forest settlers. The epidemiology of the disease varies from one group to another and each different "type" situation requires a different malaria control strategy adapted to behavior, local health infrastructure and

<sup>10</sup> Sonnenburg, F. 2004. Full report of WHO short-term consultancy in Cambodia, 3rd to 27th March 2004

environmental conditions (see Table 7). The aim is to increase the cost-effectiveness of malaria control activities without significantly increasing the demand for resources.

*Ethnic minority groups.* It has been estimated that the population at permanent risk is 5% of the total population, or about 600,000, living in areas of local transmission of malaria. Recent estimates based on GIS data on forest cover and distribution of villages and census data indicate that 350,000 persons live within the forest, 600,000 in the forest and less than 200 m from the forest fringe, 1 million when including those within 500 meters from the forest fringe and 1.3 million in the forest and up to 1 km from vegetation blocking the view in more than 180°. In general, these populations belong to various ethnic minority groups speaking different languages, each having their traditional way of life that is being increasingly altered by contact with others. Many groups practice *slash and burn* agriculture. This implies the regular burning of secondary forest in areas assigned for farming; most of the surrounding, larger, primary forest area is "taboo" for this activity and used for hunting and gathering of fruit and medicinal plants. On average, roughly 200m<sup>2</sup> land per family member/year is needed for this form of communal agriculture. Due to the poverty of the soil, every 1-2 years the *champka* is abandoned for another one following a circular movement that returns to the initial field every 10-12 years.<sup>11</sup> Depending on the distance between the *champka* and the main village, the villagers may commute back and forth every day, or they move the entire village to a secondary village close to the new field site for several months. Such a village move involves all inhabitants with all their belongings.

**Table 7: Main Risk Groups for Malaria in Cambodia**

| Risk group  | Ethnic group                    | Composition                         | Access to health care   | Immunity              | Highest at risk  |
|---|---------------------------------|-------------------------------------|---|-----------------------|--|
| (A) <i>Traditional forest inhabitants</i> (montagnards)   | Mixed non Khmer minority groups | Families                            | Little due to remoteness and linguistic barrier   | Adults only           | Children and pregnant women  |
| (B) <i>Forest fringe inhabitants.</i> Make overnight visits to the forest to hunt & to collect construction wood /other products. | Khmer                           | Villagers (predominantly young men) | Relatively good in recent years   | None                  | All age groups but the majority of cases are found in adult males. |
| (C) <i>Temporary migrants.</i> Individual forest workers, gem-miners, hunters, and others   | Khmer and foreigners            | Mostly adult males                  | Inadequate, but better than in (A) due to high mobility and more cash; private sector often preferred | Little or no immunity | Adult males  |
| (D) <i>Organized groups:</i> plantation-workers, road-workers, military, police-forces  | Khmer and foreigners            | Mostly adult males                  | Usually good, as employers want to protect workers  | None                  | Adult males, sometimes females or entire families                  |
| (E) <i>Refugees, displaced persons</i>  | Khmer                           | Families                            | Relatively good in recent years   | None                  | Children and adults alike  |
| (F) <i>New forest settlers,</i> sometimes aftermath of (E)  | Khmer                           | Families                            | None, not even private sector   | Usually low           | Children and adults alike  |

There are several ethnic minorities who inhabit the forested regions of the northeastern part of Cambodia. These traditional forest inhabitants are mostly concentrated in the provinces of Ratanakiri and Mondulakiri. The population of these areas is quite small, but malaria incidence is the highest in the country, all age groups are affected, indicating that protective levels of

<sup>11</sup> Gouvernement générale de l'Indochine, « *Ethnographie indochinoise* », Hanoi 1919

immunity are not developed, probably due to the seasonality. All age groups are exposed seasonally to long periods of intense transmission. Adults are usually partially immune but children and pregnant women are extremely vulnerable. Reliable malaria mortality data does not exist but the number of malaria related deaths in these communities is undoubtedly high. Recent demographic and health surveys<sup>12</sup> in Ratanakiri revealed an under-five mortality of 230/1000. Surveys conducted by the CNM in Ratanakiri with ECMCP support in September 2001 revealed mean falciparum prevalence in children under fifteen of 41% (ranging from 7% on the outskirts of the provincial capital to 81% in the periphery). It was estimated from these surveys that hyperendemic malaria persists in more than 50% of villages in this northeastern province. The risk group of traditional forest inhabitants (estimated pop. 350,000) is rather homogenous in its way of life despite its great ethnic diversity.

*Forest fringe inhabitants.* Many people live in rice growing communities close to the forest. Villagers (predominantly young men) make frequent overnight visits to the forest to hunt and to collect construction wood and other products. These visits frequently result in malaria. Cases returning to the village can infect anopheles mosquitoes breeding in and around the rice fields. Although these species are less efficient vectors of malaria than the one found in the forest, limited local transmission can occur. All age groups are therefore at risk but the majority of cases are found in adult males.

*Temporary migrants.* People working in the forest for extended periods such as gem miners, loggers, sandal wood collectors, soldiers, security forces and refugees are at high risk of contracting malaria. Most are adult males, although quite often whole families including women and children migrate. People seeking firewood, sandalwood and wood for charcoal are often poorer people from non-forested villages. They may come from villages near the forest but many also come from far-flung regions of the country when seasonal demand for labor in those areas is low. Often they have little or no immunity to malaria. Most attend health facilities close to the forest where they work but many also seek treatment when they return to their homes. Generally this group of people exhibit late treatment seeking behaviour. The second risk group of temporary forest migrants (estimated pop. 500,000 to 1,700,000) is individualistic and heterogeneous as it includes hunters, individual private wood cutters, charcoal producers of both sexes, precious wood collectors, company loggers, gem miners and soldiers.

Estimation of the size of this group is extremely difficult. It is believed that every year, about 1-2 million people in Cambodia are temporarily exposed to malaria, often for a very short period. The group accounts for a large part of the 'visible' malaria problem, occupying hospital beds as a result of severe malaria, for which treatment is sought, but somewhat late.

*Organized groups.* These comprise of plantation-workers, road-workers, military, police-forces. A high proportion of malaria cases have been in adult males, due to their involvement in the forested border areas. A large number of children suffer from malaria in areas where the rubber plantation workers live.

Again the size of the group is difficult to estimate. In principle, it should be easy to organize both curative and preventive services, but in practice these services are not always of good quality; plantation-workers are often afraid of reporting ill, and they therefore seek treatment that may be sub-standard at private facilities

*Refugees and displaced persons.* Massive movements of refugees and internally displaced persons (IDP) occurred during the mid-1990s. In 1997-8, these movements increased dramatically with over 150,000 rural Cambodians fleeing the areas of military conflicts

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<sup>12</sup> Health Unlimited: Health Situation Analysis Survey in Ratanakiri province, October-November 2001

seeking shelter in temporary new camps in Cambodia or Thailand. In 1997 and 1998, epidemics occurred in former Khmer Rouge areas especially in camps of internally displaced persons (IDP) and for new settlements of about 100,000 refugees. The military conflict, combined with a drought in 1998 disrupted the agriculture in the area, and as a consequence, people entered forests to look for food sources or sellable products. Following the peace settlement between the government of Cambodia and the resistance forces in December 1998, refugees began to return to Cambodia. Around 36,000 people returned to Cambodia within the first three months of 1999. Most of the refugees returned to Anlong Veng and Battambang in the northwest of the country, smaller numbers returned to the remote eastern provinces of Mondulakiri and Ratanakiri. Returnees have returned to heavily mined areas, especially in the districts of Samlot and Anlong Veng. In the early 1990s, besides the refugees in the border camps, a further 100,000 people were estimated to be internally displaced within Cambodia. Returning refugees were susceptible when returning to highly endemic areas.

In recent years, large epidemics have not occurred; this is believed to be a result of the gradual cessation of the large population movements, the wide availability of IBN that reduces the risk of infection in endemic areas, and the preventive intervention with IBN targeted at large populations entering risk areas, such as resettlement of refugees returning from Thailand to Mondulakiri, Ratanakiri and Stung Treng Provinces.

*New forest settlers.* Families who, for economic or political reasons, relocate to forested areas to establish farms are initially at high risk of contracting malaria. Their immunity is usually low. Malaria transmission diminishes with continued development and deforestation of the settled area. A large number of children suffer from malaria among the rubber plantation workers. (estimated pop. 150,000 including refugees).

## **7. Epidemics**

Although Cambodia has not reported any epidemics since 2000, there is however a potential for malaria outbreaks in the country due to the movements of populations from areas of no or low transmission to highly endemic forest areas.

## **8. Epidemiological Trends**

Notwithstanding the obvious deficiencies of the available data set (Table 1), the long-term trends are clear enough: There has been a steady reduction in the severe case fatality rate reflecting improvements in patient care in public health facilities. The total number of clinically diagnosed and treated malaria cases in the country, which was declining year after year until 2002, rose quite steeply in 2003 (from 110,762 cases in 2002 to 132,762 cases in 2003), an increase of nearly 16.4%. The malaria program was acutely short of funds in 2003, since two major donor projects, the Communicable Disease Control and Health Development Project (CDCHDP) supported by the World Bank and the EC supported Malaria Control Project, both ended in 2002; and the start of the Health Sector Support Project (supported by WB/DFID) and the Global Fund Round 2 program (on which the NMCP pinned all its hopes on) were both delayed. However, the number decreased to 101,857 in 2004, the year being significant for the launch of the GFATM Round 2 malaria program and the full-scale implementation of the HSSP.

There has also been a steady decline in the number of cases reported since the 1995 peak except for the recent increase in 2003 (Table 8 and Figures 3 to 8) and this despite the confounding effect of recent improvements to the reporting system. This trend is confirmed by an examination of long-term changes in parasite composition by species. Numbers of vivax malaria cases tend to be quite stable (parasite stages rest in the liver out of reach of drug therapy and then reappear periodically long after initial infection) and so the slow but

steady decline in the proportion of cases caused by *P.falciparum* (Table 8) is a relatively robust indicator that the malaria situation is improving. Improved malaria prevention and control activities have undoubtedly played a major part but other factors have also had a positive impact. A part of the decrease seen in malaria cases in recent years could be attributed to the gradual decentralization and extension of all key activities related to the malaria control program to the remote and inaccessible malaria endemic areas, thus indicating that the coverage of the program has been gradually increasing. Another significant contributor to the decline is the increased knowledge, health seeking behavior and malaria related practices among the people who are living in malarious areas. More and more areas have been covered with IBNs in recent years and more and more population at risk has been using the IBNs and this may account for some of the decline seen in the disease in recent years. The decreased number of severe malaria cases and number of deaths in recent years indicates that the malaria case management may have significantly improved in the public health facilities and this may have been coupled with greater and earlier use of public health facilities by fever cases, owing to greater awareness and sensitization efforts in the sphere of behavior change communication. Over the past few years a number of social and political changes have resulted in reduced man-vector contact. Increased political stability has resulted in a reduction in military activities in forested areas, a government enforced ban on illegal logging has greatly reduced the numbers of people venturing into forests to collect timber and major population displacements and resettlement in forested areas have slowed down considerably. Nevertheless, morbidity and mortality in Cambodia remain unacceptably high and efforts must continue to bring the disease under control.

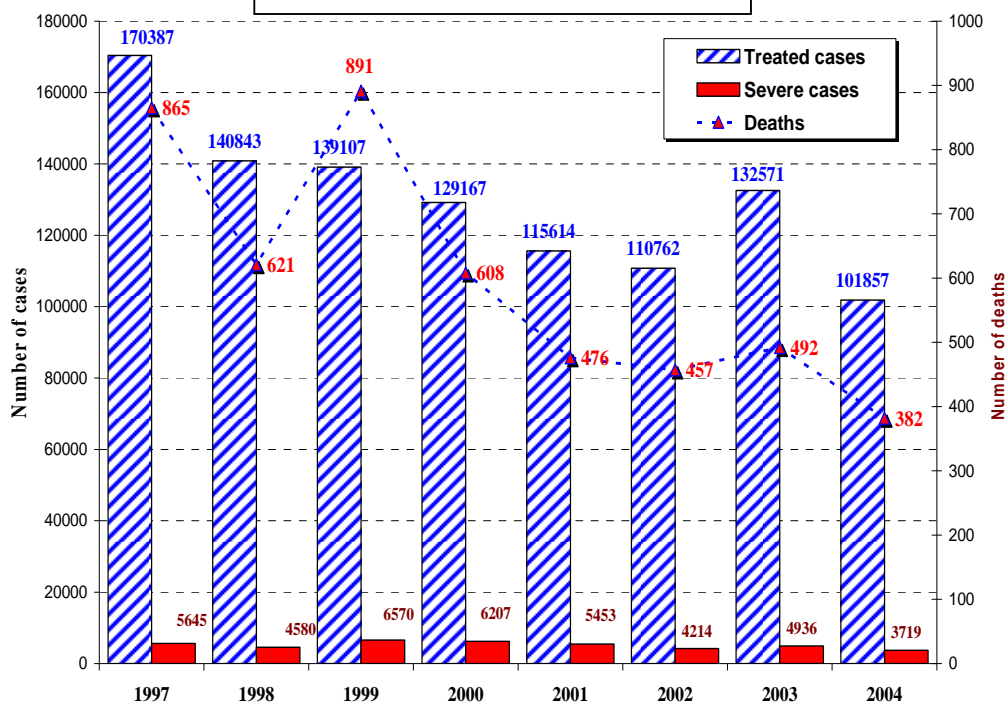
**Table 8: Recent epidemiological data (1996-2004) based on statistics from public sector health facilities issued by the CNM.**

| Years | Total Cases | # of Positive slides | Positive Dipstick | Confirmed cases | % Pf | Severe cases | Deaths | CFR* % | Severe Case Fatality Rate | IR per 1000 |
|-------|-------------|----------------------|-------------------|-----------------|------|--------------|--------|--------|---------------------------|-------------|
| 1996  | 107265      | 80691                | N/A               | 80,691          | 94%  | 4,372        | 741    | 0.69   | 17.0%                     | 9.5         |
| 1997  | 170387      | 88029                | N/A               | 88,029          | 93%  | 5,645        | 865    | 0.51   | 15.3%                     | 15.0        |
| 1998  | 140843      | 58874                | N/A               | 58,874          | 93%  | 4,580        | 621    | 0.44   | 13.6%                     | 12.4        |
| 1999  | 139107      | 58478                | 6201              | 64,679          | 93%  | 6,570        | 891    | 0.64   | 13.6%                     | 12.3        |
| 2000  | 129167      | 51320                | 11122             | 62,442          | 93%  | 6,207        | 608    | 0.47   | 9.8%                      | 11.4        |
| 2001  | 115614      | 42150                | 11451             | 49,153          | 92%  | 5,453        | 476    | 0.41   | 8.7%                      | 9.6         |
| 2002  | 110762      | 38048                | 8854              | 41,822          | 89%  | 4,214        | 457    | 0.41   | 10.85%                    | 8.6         |
| 2003  | 132571      | 42227                | 29031             | 74449           | 88%  | 4,936        | 492    | 0.37   | 9.96%                     | 10.26       |
| 2004  | 101857      | 37389                | 22356             | 59,745          | 82%  | 3719         | 382    | 0.38   | 10.3%                     | 7.5         |

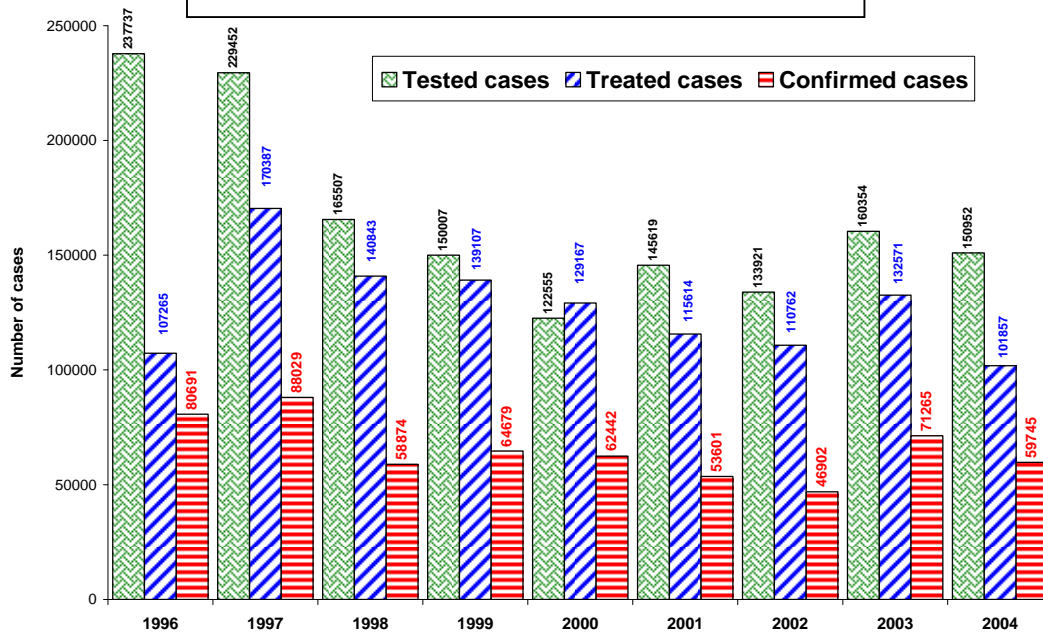
Source: Health Information System

\*Note: CFR%: Case Fatality Rate among treated cases, IR: Incidence Rate

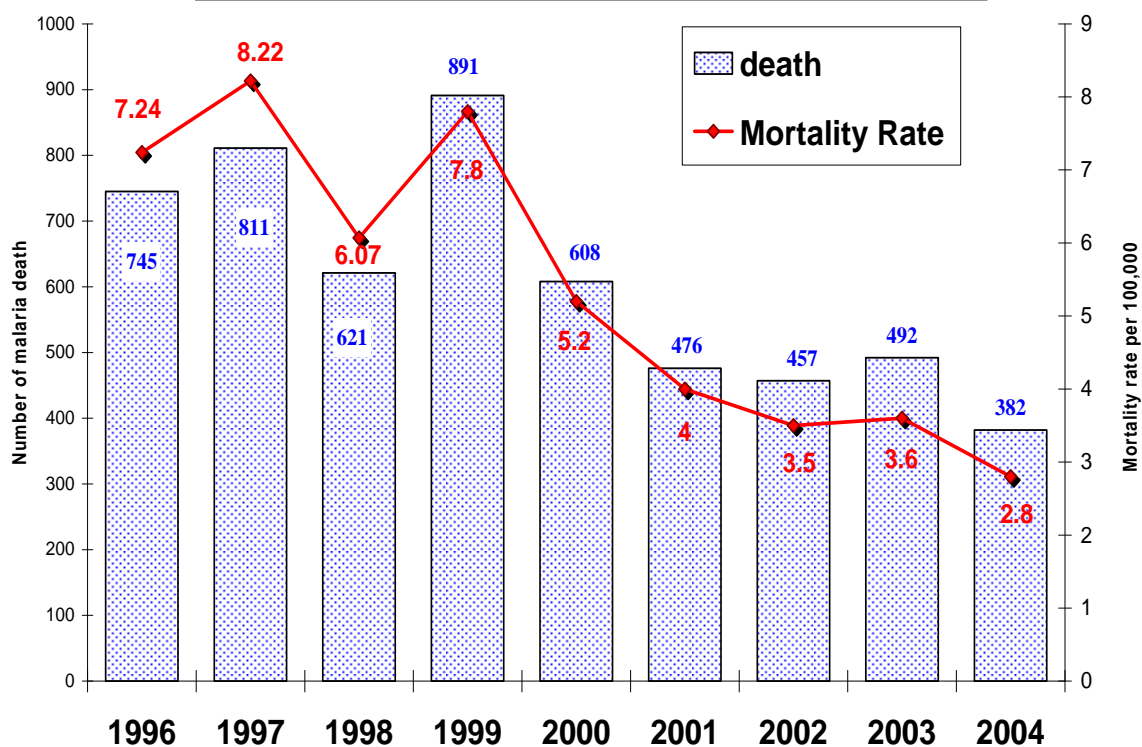
**Figure 3: Malaria total treated cases, severe cases and deaths during 1997-2004 in Cambodia**



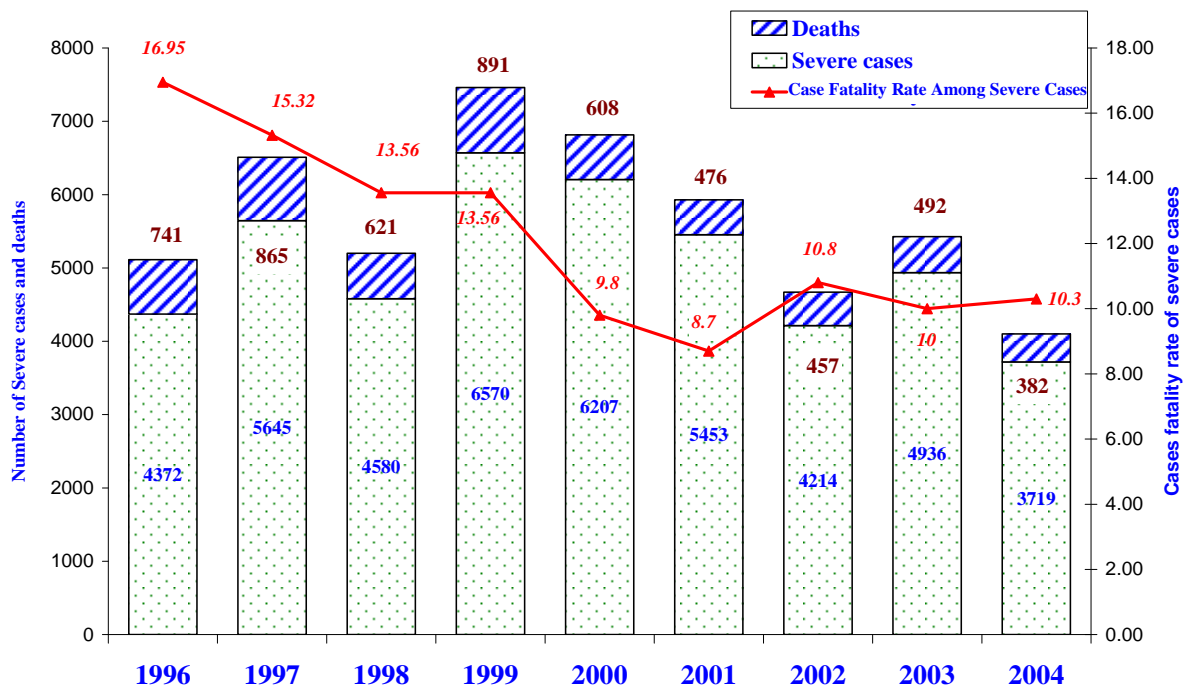
**Figure 4: Malaria tested cases, treated cases and confirmed cases during 1996-2004, Cambodia**



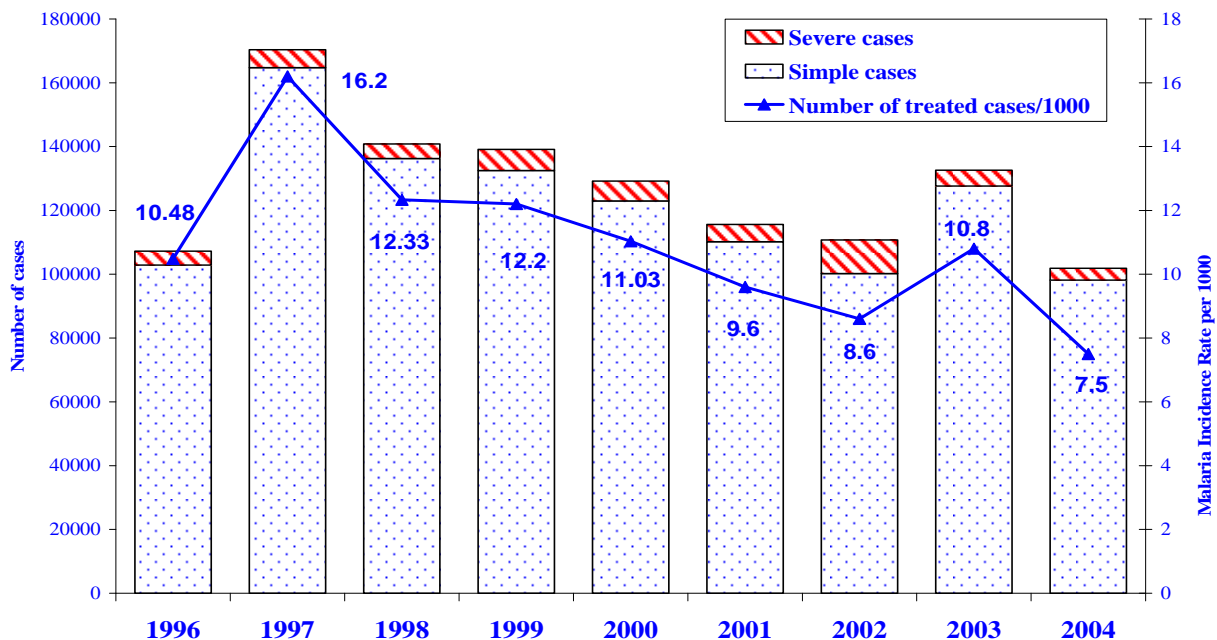
**Figure 5: Malaria Mortality in Cambodia 1996-2004**



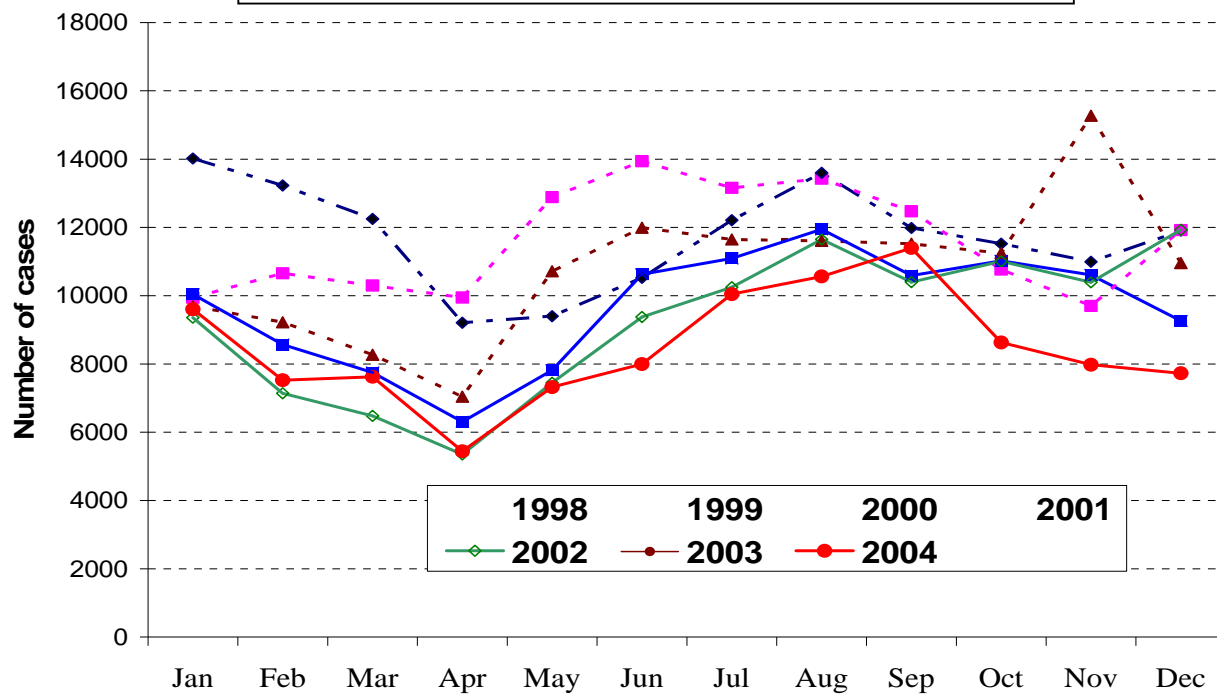
**Figure 6: Malaria severe cases, deaths and case fatality rate among severe cases in Cambodia 1996-2004**



**Figure 7: Simple and Severe malaria cases and Number of treated cases per 1,000 in Cambodia from 1996-2004**



**Figure 8: Number of treated malaria cases in Cambodia during 1998-2004**



## 9. Main Causes of Malaria Deaths

- Predominance of the falciparum variety of malaria
- Poor health infrastructure especially in the high transmission areas
- Poor communication systems- poor road conditions, lack of suitable vehicles, lack of telephone facilities, etc. resulting in treatment delays
- Occupational hazard among the military personnel, forest workers, miners, etc.
- Remoteness & inaccessibility of affected areas

## C. Diagnosis & Treatment, Drug Resistance & Counterfeit Antimalarial Drugs

The national malaria treatment policy has been in line with global movement toward artemisinin combination therapy (ACT) with an efficacious prepackaged drug-combination therapy of Artesunate and Mefloquine being in use in the country since the last five years. Presently, malaria in Cambodia like in many other developing countries is often self diagnosed and treated; many episodes of fever not caused by malaria are therefore self-treated with antimalarials. Currently malaria is being diagnosed either clinically or by rapid diagnostic test or microscopy. The recent Cambodia Malaria Baseline Survey (2004) revealed some startling facts; either microscopy or RDT was only available at 58% of the 24 public health facilities surveyed. 54% of the staff were found to be trained on clinical diagnosis and microscopy while only 29% were trained on clinical microscopy and RDT. The RDT used in Cambodia, Paracheck helps in diagnosis of only the falciparum variety of malaria and hence misses *P. vivax* cases. Only 5.7% of those with fever who were tested were found to be positive (4.1% for Pf and 1.4% for Pv) during the CMBS 2004, thus indicating the possible over-treatment of malaria when it is based only on clinical diagnosis. There has also been concern with the quality of the RDTs in the climatic conditions prevailing in the field. A recent innovation has been the use of a cool box. There have also been political challenges for RDT use by VMWs, who are relatively less educated volunteers selected and trained from the hyperendemic villages. Low utilization of RDTs when social marketed with Malarine suggests that many in the private sector are treating without using RDTs, which should be an area of concern.

Shortcomings and unavailability of laboratory services in some health facilities lead to the excessive use of inappropriate treatments and facilitate spreading of resistance. Studies have shown that the majority of those who suffer from a malaria-like illness will first seek a treatment in the private market before presenting to government services. In areas with poorly functioning services, people spend an average of US\$10 to treat "mild malaria" and \$26 to treat "severe malaria". Consequently malaria represents a heavy economic burden, as an income loss plus as extra spending to purchase unsuited and often-dangerous medications, such as infusions on the private market. A cross-sectional study on community drug use practices in malaria (supported by MSH-EC-USAID-WHO)<sup>13</sup> carried out in October 2002 in four Cambodian provinces along the Cambodia-Thai border that the public distribution pre-packaged drug combination therapy of A+M together with the socially marketed Malarine® was only used by 6.1% of children, 1.8% infants and 10.8% of adults. The Cambodia Malaria Baseline Survey (2004) revealed that while 40-60% of patients living in high-risk areas were aware of either Malarine or A+M, only 17-25% knew that a full course is necessary; thus reflecting on the possible low proportion of patients in either the private or public sectors actually receiving the ACTs.

Efforts are being made to improve the quality and confidence in public services and to organize diagnostic facilities in remote districts. Rational drug use and better understanding of the private drug sellers are priorities for the country which is faced with increasing drug resistance. Yet, the Cambodia Malaria Baseline Survey (2004) revealed that almost 60% of public health facilities reported stock outs of RDTs or antimalarials. Hardly any facilities at all

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<sup>13</sup> RPM Plus, MSH: Community drug use practices in malaria in Cambodia: a cross-sectional study, February 2003

reported less than one-week disruption of stock over the last three months for any antimalarial. One facility each had less than one-week disruption of stocks of tetracycline, artesunate tablets and suppositories, and 4 of quinine injection. All which reported (N=8) had stock outs of the first line drug. 88% (21 out of 24) health centers claimed to have the national malaria treatment guidelines with 71% (15) of these being the latest December 2002 version. This is not adequate, but it has been observed in the past that guidelines may be given to a health facility and not shared with all staff. However, most *Plasmodium falciparum* cases were treated with the recommended first-line drugs A+M. Only 42% of facilities possessed the national diagnosis guidelines with only 25 % (2) of these being from 2002, the others being 1994 and before. The lack of national guidelines and frequent drug stockouts severely limit the capacity of the health facilities to provide adequate treatment of malaria. Recent monitoring and supervision reports submitted by senior CNM staff indicate that the NMCP is threatened by drug shortages and stock-outs. Poor procurement approaches have persisted. Some of the key findings reported by senior CNM staff in their monitoring and supervision reports are:

- The data on total caseload of malaria at district/province level is often fragmented which makes trend monitoring and accurate assessment of the status of malaria control, at any point in time, a challenging task;
- Essential supplies of all antimalarial drugs and reagent items are not available in all public health facilities, and in sufficient quantity at the same time;
- National Treatment Guidelines are not always being followed owing to the problem of uncoordinated drug and reagent supply. In some instances, artesunate and mefloquine were being used in monotherapy even when A+M products were available;
- The Health Centre staff tend to be very resourceful in trying to provide adequate drug treatment for malaria when first line and second line treatment items are not fully available;
- The availability of the parachek-dipstick diagnostic reagent is often out of alignment with delivery of drug products;
- Ineffective communication / feedback between all major key players at national and provincial level on the status of supply orders thwarts effective planning and decision making in a limited-resources scenario;
- Drug and reagent storage system is often poor with stock rotation and inventory control not being practiced;
- Malarine products were not available in the private pharmacies but A+M products were available for purchase at prices ranging from 1 to 2 US\$ per pack.

Multi-drug resistance has been recorded in Cambodia since the 1980s, and is considered a problem of international health. In the 1980s and early 1990s, a considerable proportion of malaria cases seen in eastern Thailand and Bangkok's referral hospitals, had been contracted in Cambodia. In recent years, population movements across the Thai-Cambodian border have been much reduced. The multi-drug resistance situation in the formerly notorious areas in western Cambodia has stabilized; chloroquine and sulfadoxine-pyrimethamine remain ineffective, while mefloquine resistance is still only moderately high. In contrast, in northeastern Cambodia, which until the early 1990s had almost fully chloroquine-sensitive malaria (because there were almost no external migrants, no health services and no antimalarial drugs), there is now moderate resistance to chloroquine and sulfadoxine-pyrimethamine.

Malaria treatment and control in Southeast Asia are hampered by the spread of resistance to common antimalarial drugs, especially along the Cambodia-Thailand border where multi-drug resistant malaria is highly prevalent. Chloroquine-resistant parasites were first detected in Cambodia at the beginning of the 1960s. Several studies have since confirmed the high level of resistance in northwestern Cambodia. The chloroquine and sulfadoxine-pyrimethamine

combinations can no longer be used in this area, and the selection of an alternative, affordable and efficient treatment is problematic. Mefloquine was progressively introduced as a first-line treatment. However, isolates with decreased sensitivity to this drug have already been observed in some western provinces, indicating that the efficacy of this drug alone is compromised. The quinine plus tetracycline association has been proposed as first-line treatment along the Thai border, and as second-line treatment in other areas where resistances are less marked. In areas of chloroquine resistance doxycycline may advantageously substitute for tetracycline in combination with quinine because of its better stability and longer elimination half-life. However, these treatment regimes have never become popular in Cambodia or regularly used.

Development and implementation of treatment policy have for several years been a particular challenge in Cambodia because of the high levels of antimalarial drug resistance, the limited national resources for health and the important role played by the private sector. The NMCP has been very effective in updating treatment policy on the basis of regularly collected efficacy data and new drug availability<sup>14</sup>. The latest guidelines were issued in November 2004 and contain significant changes from the previous guidelines of 2002. Pre-packaged combination therapy (mefloquine + artesunate) has been developed for public (branded as "A+M") or private sector (branded as "Malarine") use. Rectal artesunate, especially for children in remote areas has been introduced.

The current national malaria treatment guidelines recommend the following:

- ☐ For uncomplicated *P. falciparum* malaria or mixed infections with *P. falciparum*:
  - ◆ First line treatment: combination of artesunate with mefloquine (A+M)
  - ◆ Second line treatment: combination of quinine and tetracycline
- ☐ For severe and complicated *P. falciparum* malaria or mixed infections with *P. falciparum*:
  - ◆ The first line treatment is artemether intra-muscular injection combined with A+M or oral mefloquine (in case A+M is not available) and
  - ◆ The second line treatment is quinine administered intravenously combined with oral tetracycline.

CNM has the mandate to ensure that all the three approaches to early diagnosis and treatment namely through social marketing, village based EDAT and public sector health facilities follow national treatment guidelines and through constant monitoring and supervision ensure rational use of the antimalarial drugs. The guidelines are updated at two-year intervals based on the results of drug resistance monitoring and cost-effectiveness studies. WHO/USAID have committed to support monitoring of drug resistance and drug usage over the next five years. Several steps are currently being undertaken to ensure rational use of the national treatment guidelines:

- pre-packaging of the treatment regimens in order to improve patients' compliance
- training of all medical staff on the national treatment guidelines, with a focus on high risk areas to improve malaria diagnostic and treatment practices
- training health staff to enhance awareness among patients and communities on malaria signs and symptoms and on the need for seeking early care; through the use of appropriate IEC materials
- supervision by CNM/PHD/OD staff of the implementation of the national treatment guidelines at different levels of health facilities in the country
- conducting of regular surveys on treatment-seeking behaviours of at-risk communities as well as treatment practices of public and private sector medical personnel
- ensuring adequate supplies of diagnostics and drugs in both public and private (through social marketing approach) sectors

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<sup>14</sup> Webster, J: Malaria control in complex emergencies- Cambodia. Malaria Consortium. July 2000

For monitoring of drug resistance, CNM has selected 8 sentinel sites. 4 sentinel sites were set up in the first phase in Battambang (Sanpouv Loun), Pailin, Pursat (Veal Veng), Preah Vihear. 4 more sites have been established in Kg Speu (Oral), Oder Mean Chey (Anlong Veng), Kratie (Snoul), Rattanakiri, in the second phase in 2003. Monitoring is being conducted at 2 yearly intervals at each site.

As for drug usage, a baseline survey was conducted in October 2003 in the first four provinces cited above, in collaboration with MSH as part of a USAID-funded project. Monitoring drug use activity has been ongoing since 2004.

One problem detected in 1999 is the widespread occurrence of fake antimalarial drugs:

Population surveys in the remote malaria endemic areas indicated the following:

- Presence of fake anti-malarials in 70 - 80% of private drug outlets in 1999
- Fake Artesunate was available in up to 80% of drug retailer shops in 1999
- Fake Mefloquine was available in up to 75% of drug retail shops in 1999

In the same areas,

- 10 -15% of patients sought first line treatment at the public sector where national protocol is used and fake drugs were not available;
- 85% of patients sought first line treatment at the private sector where self prescription is common and availability of fake drugs is 70 - 80% of the drug outlets

#### **D. Insecticide Resistance**

In forested areas of Cambodia, the main vectors of malaria are *Anopheles minimus* and *An. dirus*. Both, especially the latter, are partially exophilic, and this limits the effectiveness of house-spraying. However, as much as the natural behaviour pattern of mosquitoes, the ineffectiveness of house spraying can be ascribed to the open walls of many dwellings of people living in forests and to the fact that some of the people at risk spend the night outside the villages that are supposed to be protected by spraying. Insecticide-treated nets (ITN) may be effective, even when house spraying are not effective, the determining factor being the actual use of them by the population during the hours when vectors bite. Recent entomological studies showed that the main biting times for the two main vectors are generally late at night between 22:00h and 02:00h, so early biting should not be an obstacle to the effectiveness of ITN, but this factor needs to be monitored, as behaviour could change as a result of selection pressure.

Five insecticide compounds of the pyrethroid group are recommended by WHOPES for treatment of mosquito nets. The Cambodian bed net programme is currently using Lambda-cyhalothrin, alphacypermethrin and Deltamethrin (K-Othrin) 1% SC as insecticides of choice. There is no evidence for any build up of insecticide resistance to deltamethrin in malaria vectors in Cambodia from areas where thousands of bed nets have been treated annually for up to 8 years (since 1996). The insecticide susceptibility tests carried out by CNM in 2003 have revealed that both *An. dirus* and *An. minimus* are still susceptible to permethrin (the chemical used in the LLIMNs), deltamethrin, alphacypermethrin and Lambda-cyhalothrin (currently being used to treat bed nets). Monitoring insecticide resistance is an ongoing activity of CNM's Entomology department with support from WHO.

#### **E. Malaria-associated childhood illnesses**

Although malaria affects only about 13% of Cambodia's population and, because of the particular transmission pattern of this disease in Cambodia, it affects children under five (7.3%) to a lesser extent; however in forested areas with high transmission, malaria represents a very high burden of morbidity and mortality among young children. According to the Cambodian Demographic and Health Survey 2000 (CDHS 2000), in the Mondol-

Ratanakiri cluster the under-five mortality rate was 229 deaths per 1,000 live births, the highest in the country and compared to a national average of 124; this is the highest in the Western Pacific Region. In the Preah Vihear-Kratie-Stung Traeng cluster the rate was 120, in Koh Kong 91 and in Kampong Thom 99 and in the Kampot-Krong Kaeb- Sihanoukville cluster 124 deaths per 1,000 live births respectively, but these provincial or cluster aggregates probably underestimate the mortality in highly malarious areas where the villages targeted for the ongoing VMW project lie. The CDHS figures for Ratanakiri compare well with a health survey undertaken by Health Unlimited (HU) in 2001 in the same province which found an U5MR of 187 per 1000 live births. According to the epidemiological profile 2 described by Black RE et al<sup>15</sup>, which may be applicable to the malarious areas of Cambodia, about 25% of all under-five deaths are due to malaria but the few epidemiological data available show, however, a much lower contribution of malaria to child mortality such as 10% in Chhlong OD (Kratie) and 14% in Ratanakiri (2001/02). It is also known that there is a considerable overlap of signs and symptoms related to more than one condition, particularly acute respiratory infections (ARI) and diarrhea diseases. In the same data set from Ratanakiri collected through the VMW project, among those who died from causes other than malaria, 32% and 21% had symptoms compatible with ARI and diarrhea respectively. These two diseases also represent the two major killers of children under five in Cambodia. It is estimated that 24% of all childhood deaths are due to ARI. This corresponds to about 11,000 children dying of ARI every year in Cambodia. Most acute respiratory infections are self-limited and presenting as common cold. It is pneumonia, which causes most ARI deaths, the incidence of which, in children under five is estimated to be 0.29 new episodes per child per year globally in developing countries and 0.34 new episodes per child per year in the Western-Pacific Region.

The two-week period prevalence of ARI reported in the CDHS 2000 was highest in infants between 6 and 11 months of age (27.3%) and 19.8% of all children under five had reported an ARI. Other than malnutrition, the best-known external risk factor for ARI is indoor air pollution. Cooking with solid fuels or open fires within houses is uncommon in Cambodia except for ethnic minorities, who live mainly in the malaria transmission areas. According to the national health statistics 2003, there were 471,575 new ARI cases, including upper and lower respiratory tract infections among children 0 to 4 years seen in as outpatients in public facilities and 578 children with chronic cough. In addition there were 16,397 hospitalizations of children in this age group due to ARI.

It is estimated that diarrhea disease contributed to about 24% of under five mortality (Black et al, 2003). According to the CDHS 2000, the two-week period prevalence of diarrhea in children under five was 18.9% with a peak of 29.7% among infants aged 6 to 11 months. There was considerable regional and urban-rural variation. The prevalence in rural areas was 19.4%. In 24% of all diarrhea cases, mothers reported that there was blood in the stool, which is an indication of dysentery infection. The age groups most affected are infants and young children below 24 months. Based on the HIS 2003 data, it is estimated that about 2.3% of expected diarrhea episodes among children under five were treated in public health facilities of which 9% were hospitalized and 16% of all inpatients had dysentery. The HU Ratanakiri Survey 2001 found a 2 weeks period prevalence of 36% and 54% for diarrhea and fever (which includes malaria and ARI) respectively.

#### **F. Factors contributing to improved malaria situation**

- ❑ Efforts made by CNM to expand the programme activities to the maximum possible number of health centers.
- ❑ Enhanced malaria supervision and follow-up at provincial and health center level.

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15 Black RE et al. Where and why are 10 million children dying each year? *Lancet* 2003; 361:2226-34

- ❑ Malaria training on malaria case management, dipstick use and laboratory diagnosis skills.
- ❑ Increasing conformity with the National Treatment Guidelines
- ❑ Wider usage of dipstick methodology has enhanced the scope for early diagnosis and prompt treatment.
- ❑ Active health education efforts coupled with the expansion in the distribution of IBNs to high and medium transmission zones through integrated approaches and outreach activities.
- ❑ Considerable increase in the knowledge of people about malaria.
- ❑ All round improvements made in malaria management and treatment as well as prevention.

### **G. Achievements of the Programme**

1. The malaria situation has greatly improved within the last few years and the programme has been able to achieve a number of breakthroughs.
2. No further malaria epidemics recorded in former Khmer Rouge areas since 1999.
3. No. of malaria cases have been reduced by almost two-thirds in several areas due to effective control measures such as improving access to treatment and massive deployment of impregnated bed nets in areas of transmission. The reduction is more pronounced for *Pl. falciparum* malaria and the ratio is now gradually shifting in favour of *Pl. vivax*.
4. A successful and ongoing fund raising drive has resulted in increasing resources for malaria control over the level of previous years.
5. The program has been able to introduce and scale up a number of innovative strategies such as free distribution of prepackaged ACTs in the public health sector, use of simple diagnostic dipsticks and prepackaged ACTs and rectal suppositories of artesunate by a band of trained and closely supervised Village Malaria Workers in hyperendemic areas, social marketing of Malacheck and Malarine (a prepackaged ACT) through the private sector, recording of malaria information by private providers in 4 selected provinces, free distribution and retreatment of insecticide-treated bed nets (ITNs) in malaria endemic villages (especially through "combined outreach activities": delivering vaccinations, malaria treatment, deworming, Vitamin A and iodine capsules for specific target groups at the same time), social marketing of insecticide treated hammock nets for temporary forest-visitors, health education and participation in bed net distribution by village health volunteers, etc.
6. Partnerships with both the international funding agencies as well as with international and national NGOs have been further strengthened in the last few years. The GFATM program has served to act as a catalyst for widening the partnership network for RBM in Cambodia and CNM now directly works with as many as 15 partners (NGOs and line ministries) at the central level. A number of NGOs are also active at provincial level providing specific inputs and support to the PHDs and provincial malaria teams.
7. Capacity for planning, implementing, monitoring and evaluating the programme at central, provincial and operational districts has been strengthened through training courses, attendance at overseas and national professional courses, on-the job mentoring and counselling, overseas and inter-provincial exchange study visits, review and planning meetings and workshops, and supportive supervision visits.

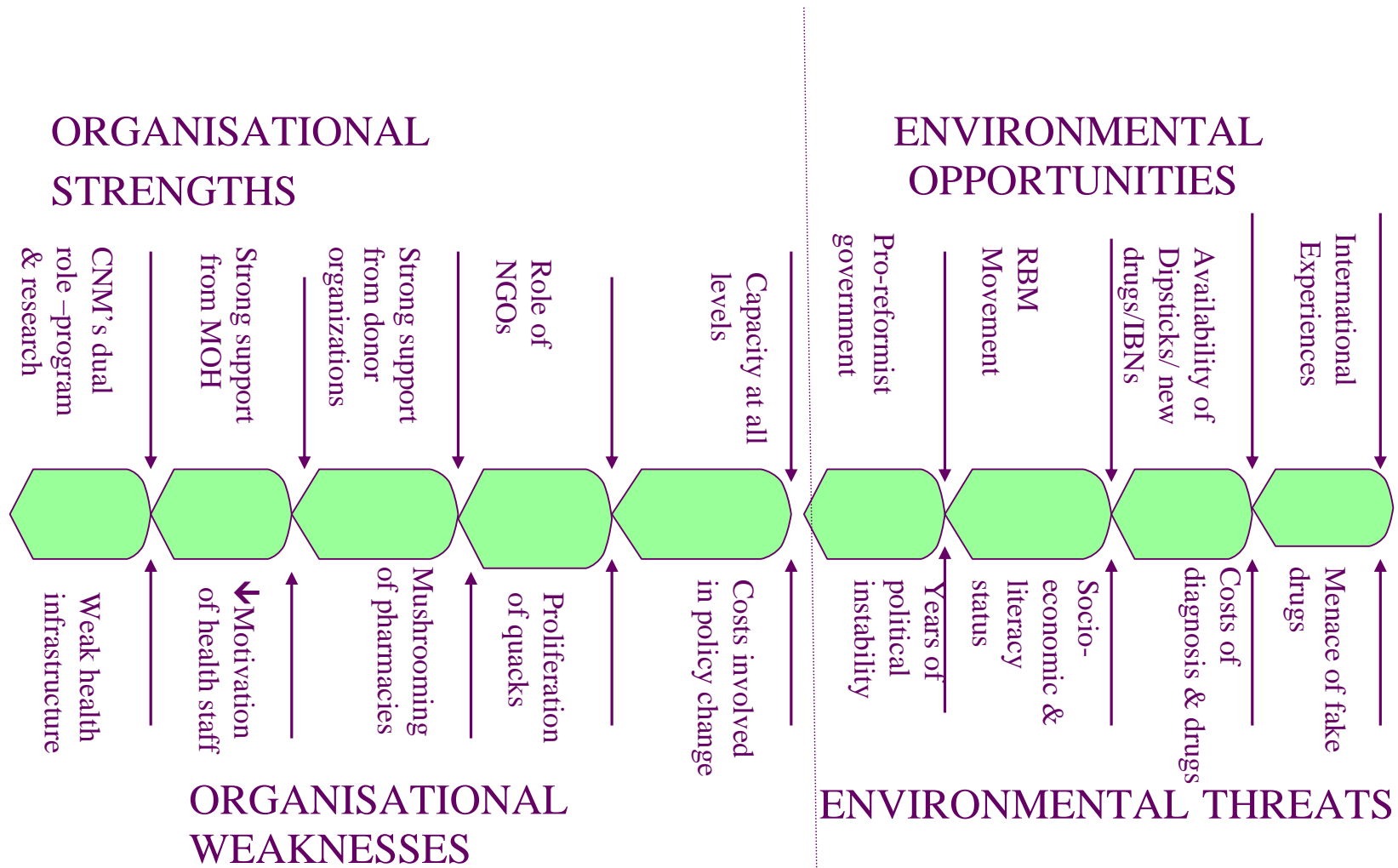
### **H. Problems and constraints faced by the NMCP**

Despite the several remarkable achievements made in a very short period of time, the NMCP still faces a wide range of constraints, which come in the way of achieving optimum organizational efficiency and programme effectiveness. NMCP faces major obstacles such as:

- i) *low motivation/level of activity* common to the general public service in Cambodia; lack of motivation among staff is mainly attributed to low civil servant salaries
- ii) difficulties associated with *coordination* between different programmes, partners and with the various funding agencies
- iii) *limited resources* both human and material, e.g., equipment (spraying machines, microscopes, transport...) or drugs supplies;
- iv) *specific funding gaps*; ideally the country would have liked to switch overnight to proven innovative interventions such as long lasting insecticidal mosquito nets (LLIMNs), but the high initial costs associated with such interventions and the limited funding that donors would like to allocate for malaria control activities, have resulted in the CNM making only modest proposals and consolidating the gains in a phased manner.
- v) *legal problems*. Civil servants are unable to enforce the existing law, e.g. sale of counterfeit medicines, or deleterious treatment practices by illegally set up pharmacies and private clinics. Unregulated private practice continues to thrive in Cambodia, dominated by unqualified practitioners and over-the-counter prescriptions
- vi) *poor knowledge, attitudes and practices* on the part of the population. Although ignorance has been overcome on a number of key issues related to malaria recognition, causation and transmission, yet misconceptions about correct preventive and treatment measures continue to prevail; and there are significant gaps between knowledge and adoption of health behaviours and practices inimical to the spread of malaria. Owing to a period of more than 20 years of civil war and social upheaval, the Cambodian society suffers from low levels of social cohesion, which comes in the way of generating the level of community mobilization that is required to bring the scourge of malaria totally under control.
- vii) *Inaccessibility of at-risk populations*, especially during rainy season coupled with inadequate and inaccessible health care facilities. High transmission areas are characterized by poor health infrastructure. Ethnic minority groups living in remote forest villages are a major risk group, posing a communication problem
- viii) *Poor communication systems*- poor road conditions, lack of suitable vehicles, lack of telephone facilities, etc. resulting in treatment delays
- ix) *Large scale population movements* into extremely high risk areas (forests, logging and mining areas)
- x) *Lack of trained staff* especially inadequate number of competent staff on microscopy diagnosis of malaria and use of dipstick tests
- xi) *Disease-conducive physical, biological and social environment* characterized by the presence of the more fatal and multiple drug resistant falciparum variety of malaria species, predominance of *Anopheles dirus*, the notorious vector species and occupational exposure among military personnel, forest workers, miners, etc
- xii) NMCP activities are *dependent* to a large extent *on external funding*. Donors provide most of the investment and as the real budget allocation from the Ministry of Health tends to be below necessary requirements, CNM's recurrent expenditures need to be regularly beefed up.

It is envisaged that many of these problems and constraints would be overcome while implementing the strategic plan for the period 2006-2010. A SWOT analysis of the national program has been depicted at the end of this chapter (Figure 9) to indicate that despite the weaknesses and threats that still loom large, there are a number of strengths and opportunities, which if capitalized upon, would result in the achievement of the objectives, set in this Strategic Plan.

**Figure 9: FORCE FIELD/SWOT ANALYSIS FOR MALARIA CONTROL IN CAMBODIA**



## **Chapter 4**

### **Strategic Gaps, Directions, Interventions and Activities**

#### **A. Relation to Health Sector Strategic Plan and support received from the Government**

The NMCP's Strategic Plan is an integral part of the Health Sector Strategic Plan 2003-2007 (HSSP) (RGC, August 2002). Within the first 'core strategy' of the HSSP, "Health Service Delivery", are five sub-strategies (p25 of HSSP). The fourth is: "Strengthen the management of cost-effective interventions to control communicable diseases". Malaria is placed under this sub-strategy (pp. 44, 55). The HSSP has placed priority emphasis on prevention and control of communicable diseases including malaria and item 16 in the Ministry of Health's Operational Objectives for 2007 is to reduce the rate of Malaria incidence to 10 per 1,000 population, and the death rate to under 0.10%. "Health Service Delivery Indicators" numbers 34 (Malaria severe case fatality rate) and 35 (Malaria incidence rate), which are reviewed as part of the Joint Health Sector Review annually, pertain to malaria. These explicit statements of priority commitment are echoed at a higher level in the explicit support for malaria given by the Government overall.

His Majesty, the former King, as well as His Excellency the Prime Minister have repeatedly mentioned malaria as one of the gravest concerns in the country. Senior Minister of Health, Secretaries of State for Health and other senior officials of the Government frequently visit malaria endemic areas accompanied by senior CNM staff and monitor and guide the programme inputs and activities. The high level of political commitment to malaria in Cambodia is thanks in part to the fact that the NMCP is now internationally renowned for its dynamic and innovative approach to problem solving. Indeed the NMCP is leading the world with its efforts to provide access to malaria EDAT for all, through the widespread use of rapid diagnostic tests and pre-packaged combination therapy delivered through a diverse mixture of public and private sector channels.

Although at present national funding is limited, key players at the Ministry for Health have committed to increasing the budgetary allocation for malaria control in the future. In the meantime every effort is being made to identify alternative sources of finance so that the coverage of the NMCP can be maximized. Funding for the malaria programme has been a mix of donor and government funds. The malaria component was included in the Cambodia Disease Control and Health Development Project from 1997 to 2002, funded from a World Bank loan. Malaria is also designated as one of the priority programmes under the Ministry of Economy and Finance's Priority Action Programme (PAP), which seeks to streamline and expand the flow of National Budget funds to priority social development programmes with effect from 2002. The Ministry of Health has also included the Malaria component in the conjoint World Bank/ADB/DFID/UNFPA financed Health Sector Support Project (HSSP) for the period 2003-2007. The Royal Government of Cambodia reiterated its priority for malaria by setting up a Technical Advisory Group for Roll Back Malaria Control with an Undersecretary of Health appointed as the Chairperson as well as setting up a Research Advisory Committee chaired by the Director of CNM. The Director of CNM is one of the members of the Cambodian Country Coordination Committee (CCC), which guides and oversees the planning, implementation, monitoring and evaluation of the Global Fund supported HIV/AIDS, TB and Malaria programmes in the country. The Director has also been included in the Technical Review Panel that reviews the proposals before they are approved by the CCC and sent to the Global Fund. Other evidences of the strong government support are the encouragement given to CNM in setting up its own web site ([www.cnm.gov.kh](http://www.cnm.gov.kh)) as well as the allocation of space and staff for the antimalarial pre-packaging facility.

## **B. Key Initiatives and Major Funding Sources**

The National Center for Parasitology, Entomology & Malaria Control (CNM), published its first ever 5-year Strategic plan in 2001. It has since been updating the plan regularly and this second Strategic plan has been more systematically and vigorously developed as compared to the previous one. CNM's past plans have been widely appreciated and a consultant<sup>16</sup> responsible for evaluating the effectiveness of DFID's assistance to the health sector between 1997-2003 had this to say; "The malaria project is a good example of a project that has been gradually taken over by the MoH, is now fully owned by it, with a strategic and operational master plan, to which donors can buy in." The CNM has also been updating the National Malaria Program Policies and Strategies document and the latest revision was carried out in December 2003.

The year 2002 marked the end of two important five-year projects, implemented concurrently, the World Bank supported Communicable Disease Control and Health Development Project (CDCHDP) and the European Commission supported Malaria Control Project (EC-MCP). The malaria program had to therefore find quick alternative sources of funding. As the planning for Health Sector Support Project was underway, CNM used its 5-year Strategic Master Plan to base its request for World Bank and DFID grants. Although the two donors agreed to pledge US\$ 3.5 million over a five year period and WHO/USAID confirmed the availability of 500,000 \$ per year up to the end of 2005, CNM realized that despite the Ministry of Health assuring another 500,000 \$ per year, there would be still be huge funding gaps, even to continue the program at the same level as in the previous years. The years of good work in the post-civil war, especially in controlling the spread of malaria outbreaks, and implementing an innovative program on evidence-based strategies, would have been nullified had the funding gaps continued. The issue of Global Fund Calls acted as the ray of hope that would ensure consolidation of the gains made during the previous five years. CNM along with 3 international NGOs prepared and submitted to the Global Fund (at Round Two) an integrated and comprehensive malaria component proposal, drafted on the basis of the strategic priorities identified by the NMCP. The proposal was approved for fast-tracked support (one of the five in the world at that round to find such approval), and the implementation has begun in right earnest in January 2004. At the time of drafting the Round 2 proposal, work on defining the Behaviour Change Communication Strategy for malaria control had just begun. In March 2003, the key partners involved in the National Malaria Program approved and adopted the "Behaviour Change Communication Strategy" document prepared with GTZ Backup's technical consultancy assistance. Based on this strategy as well as drawing inspiration from the international evidence emerging in favour of the long lasting insecticidal mosquito nets (LLIMNs), NMCP prepared and submitted to the Global Fund at rounds three and four through the CCC, a proposal as an extension of the proposal made at the Second Round, with an additional emphasis on objectives 1 and 3 of the previous proposal. The Round Four proposal was approved and the implementation is expected to commence in the latter half of 2005.

Since 1997, the country has benefited from major external budget support from World Bank (through IDA funding), WHO, World Food Programme, DFID, USAID grants for the malaria programme. In August 2002, the MoH released the much-awaited 'Health Sector Strategic Plan (2003-2007)', which envisaged a Sector Wide Management (SWiM) approach for Cambodia. The malaria programme has prepared medium term financing plans, and has also submitted these for consideration by the Ministry of Health for donor funding, for example under the conjoint World Bank/DFID/ADB/UNFPA Health Sector Support Project (2003-2007) currently being implemented. The proposals submitted to the Global Fund, however, are a significant addition to these plans, as the proposals included considerable support for NGOs and civil society projects, which have not previously been included in Government budgeting.

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16 Evaluation of DFID Health Sector Support to Cambodia 1997-2003: Maria Paalman, Senior Health Advisor, Royal Tropical Institute, Amsterdam, December 2003.

In addition, much of the Government Medium Term financial planning has been driven more by the availability or expectation of funds, rather than blanket expenditure covering all possibilities. It is in this background that the NMCP in Cambodia has been able to launch a pilot project with GTZ BACKUP Initiative support with the aim of subsequently scaling up the strategy implementation with Global Fund support at Round Five.

Even before the advent of RBM, there was a strong national programme with good funding and a collaborative approach with multiple partner involvement (albeit largely donor-driven) in order to reach the more remote and sometimes insecure regions of the country. Cambodia has been very active in the Roll Back Malaria Initiative. It has made optimum use of the opportunities provided through the Initiative to pilot and expand innovative strategies, broadened the partnership for malaria control both within the country and outside, and achieved significant success in halting the rapid progress of the disease in the country. The Malaria Consortium (April 2001)<sup>17</sup> in their analysis on country experiences relating to the RBM initiative in Bolivia, Cambodia, Ghana, Tanzania and Uganda recognized that the Cambodian program had many achievements and outlined the opportunities on which to capitalize, in order to catalyze further sector-wide thinking in the country.

The first 5-year Strategic plan (2001-2005) published by CNM in 2001, prioritized the recognition of the role & scope of private providers in malaria treatment and control and incorporation of strategies for their involvement (through regulation, training and IEC). Cambodia was chosen as the only country outside Africa which the *RBM External Evaluation Team* headed by *Dr. Richard Feachem*, visited at the beginning of 2002. This is what the External Evaluation commented about the Cambodian program: **“Good practice in Cambodia.** In Cambodia, one of the three countries visited by the Evaluation Team, RBM and malaria control were working strikingly better than seen elsewhere..... However, the Evaluation Team was nonetheless impressed by the momentum that RBM has generated. .... These linkages (between RBM and other programmes with overlapping objectives and delivery opportunities) were also being actively promoted in Cambodia. .... It is essential that NMCPs focus on the need to improve the access to and quality of both preventive and curative services delivered through the private sector. The NMCP in Cambodia is doing this<sup>18</sup>”. The development of a strategy for malaria information collection from the private sector was therefore undertaken in this background; and a proposal for funding the scaling up of this strategy along with expansion in the coverage of LLIMNs in the risk category 1 villages, establishment of an antimalarial drug quality assurance system and add-on interventions for childhood diarrhoea and ARI along in addition to malaria EDAT to be carried out by VMWs, has been submitted to the Global Fund Round Five.

### **C. The Overall Goal of the NMCP's Strategic Plan**

The overall goal of the NMCP's Strategic Plan is to contribute to the achievement of the Overall Goal of the HSSP of Royal Government of Cambodia, which is to: “Enhance health sector development in order to improve the health of the people of Cambodia, especially mothers and children, thereby contributing to poverty alleviation and socio-economic development.”

### **D. RGC's Policy Statement 2003 -2007 and Corresponding Malaria Policies**

The policy statement of the Ministry of Health, Kingdom of Cambodia is based on the national health policy, which can be found in the booklet called ‘Health Situation Analysis 1998 and Future Direction for Health Development 1999-2003’. 13 elements comprise the

17 Malaria Consortium (April 2001): “Addressing Malaria Sector-Wide: Improving co-ordination and management of external support”. A background paper for the Fourth RBM Global Partners Meeting. 18-19 April 2001, Washington DC including country experiences in Bolivia, Cambodia, Ghana, Tanzania and Uganda.

18 Abstracted from the Report of the External Evaluation Of Roll Back Malaria (April 19, 2002)

policy statement. The corresponding elements relevant to malaria control in Cambodia are shown in the following table (Table 9).

Table 9: Elements of RGC's Health Policy Statement and corresponding Malaria Policy Elements

| #  | Elements of RGC's Health Policy Statement  | Corresponding malaria policy elements  |
|----|--|--|
| 1  | Implement sector wide management through a common vision and effective partnerships among all stakeholders   | Implement NMCP through shared objectives and effective partnerships among public and private sectors and NGOs  |
| 2  | Provision of basic health services to the people of Cambodia with the full involvement of the community  | Provision of malaria prevention and treatment services to the people of Cambodia with the full involvement of the community, particularly through village based malaria workers in remote and inaccessible areas providing EDAT and village health volunteers in endemic villages promoting behaviors and practices aimed at reducing malaria transmission |
| 3  | Provision of affordable, essential specialized hospital services   | Provision of affordable malaria diagnosis and treatment services at all referral hospitals   |
| 4  | Decentralization and de-concentration of financial, planning and administrative functions within the health sector   | Decentralization and de-concentration of malaria control activities to the operational district level  |
| 5  | Priority emphasis on prevention and control of communicable and selected chronic and non-communicable diseases, on injury, the elderly, adolescents and vulnerable groups such as the poor, and on managing public health crises | Priority emphasis on prevention and control of malaria especially among vulnerable groups such as the poor and ethnic minorities   |
| 6  | Priority emphasis on provision of good quality care to mother and child especially essential obstetric and paediatric care   | Priority emphasis on provision of good quality malaria care to women and children, integrated with other health interventions to the extent possible   |
| 7  | Active promotion of healthy lifestyles and health-seeking behaviour among the population   | Active promotion of malaria preventive healthy lifestyles and treatment-seeking behaviour among the at risk population   |
| 8  | Emphasis on quality, effective and efficient provision of health services by all health providers  | Emphasis on quality, effective and efficient provision of malaria services by all health providers (public/private sectors and NGOs)   |
| 9  | Optimization of human resources through appropriate planning, management including deployment and capacity development within the health system  | Optimization of malaria related human resources through appropriate planning, management including deployment and capacity development within the health system  |
| 10 | Increase promotion of effective public and private partnerships for effective and efficient basic and specialist care  | Increase promotion of effective public and private partnerships for effective and efficient early diagnosis and treatment of malaria   |
| 11 | Effective use of the health information for evidence-based planning, implementation, monitoring and evaluation in the health sector  | Effective use of the health information for evidence-based malaria programme planning, implementation, monitoring and evaluation   |
| 12 | Implement health financing systems to promote equitable access to priority services especially by the poor   | Ensure use of nationally operated financing systems for effective malaria control among the poor and downtrodden.  |
| 13 | Further development of appropriate health legislation to protect the health of providers and consumers   | Advocate for further development of appropriate health legislation to protect the health of providers and consumers, especially against counterfeit and substandard antimalarial products  |

The 13 elements of national health policy provide the basis for the national health strategic plan. The 20 strategies in the national health strategic plan flow from these elements. The malaria program's strategic plan has also been developed around the same elements and employing similar approaches.

#### **E. Priority demographic and health concerns related to malaria**

- The rise in child mortality to which mortality and morbidity from malaria makes a significant contribution
- High case fatality from malaria
- Poor antenatal coverage
- Population growth and new forest settlements
- Harmful practices among consumers and providers including unhealthy lifestyles and widespread inappropriate treatment seeking behaviour on the part of malaria victims

#### **F. Priority Areas of Work**

To get the envisaged results the RGC has during the period 2003-2007, given priority to six areas of work, indicated in Box 2 shown below.

##### **Box 2. Six priority areas proposed in HSSP**

Health service delivery  
Institutional development  
Quality improvement  
Human resource development  
Health financing  
Behavioral change

The NMCP's interventions are also focused around these six areas of work.

#### **G. RGC's Health Strategies and NMCP's Corresponding Strategic Actions**

Table 10 shows how the NMCP's strategic actions correspond to the 8 essential core strategies in the national health strategic plan.

Table 10: NMCP's strategic Actions in congruence with RGC's Health Strategies

| <b>RGC's Health Strategies</b>  | <b>NMCP's Corresponding Strategic Actions:</b>  |
|---|---|
| <i>Health service delivery</i>  |   |
| Further improve coverage and access to health services especially for the poor and other vulnerable groups through planning the location of health facilities.            | Scale up the village malaria workers (VMWs) approach in order to ensure that all hyperendemic, inaccessible and remote villages are covered with locally identified, trained and equipped VMWs. |
| Strengthen the delivery of quality basic health services through health centers based upon minimum package of activities.   | Ensure the availability of diagnostic dipsticks and blister packs of artesunate combination treatments at all health centers and health posts   |
| Strengthen the delivery of quality care, especially for obstetric and paediatric care, in all hospitals through measures such as the complementary package of activities. | Ensure all pregnant women and under five children with malaria are provided appropriate diagnosis and treatment   |

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|   |  |
|---|--|
| Strengthen the management of cost-effective interventions to control communicable diseases.   | Ensure the implementation of NMCP's four-pronged strategy against malaria (viz. BCC, ITN/LLIMN, EDAT and capacity building)  |
| Strengthen the management and coverage of support services such as laboratory, blood safety, referral, pharmaceuticals, equipment and other medical supplies and maintenance of facilities and transport.                       | Strengthen laboratories and pharmacies located in different health facilities in effective supply management of malaria diagnostics and treatment regimens   |
| <i>Behavioural change</i>   |  |
| Change for the better the attitudes of health providers sector wide to effectively communicate with consumers especially regarding the needs of the poor through sensitisation and building interpersonal communication skills. | Raise awareness among public, private, NGO health providers about quality malaria case management services and professional ethics (accountability) including inter-personal communication skills                        |
| Empower consumers, especially women, to interact with other stakeholders in the development of quality health services through mass media and inter-personal communication.   | Scale up women change agent health educators in malaria endemic villages through collaboration with the Ministry of Women Affairs  |
| Promote healthy lifestyles and appropriate health seeking behavior through advocating for healthy environments and implementing counselling and behavioural change activities.  | Enable communities in the adoption of malaria avoidance measures and appropriate treatment seeking behaviour through BCC training, motivation and counselling of village health guides and HC feedback committee members |
| <i>Quality improvement</i>  |  |
| Introduce and develop a culture of quality in public health, service delivery and their management through the use of Ministry of Health quality standards.   | Establish and maintain antimalarial drug quality assurance system and support, encourage and help managers develop quality client/consumer orientated services   |
| Develop and implement minimum and optimum quality standards for the public and private sectors incorporating pro-poor and gender issues through the use of appropriate tools.   | Update national treatment guidelines periodically and ensure that all providers, whether in private sector or public sector, adhere to them  |
| <i>Human resource development</i>   |  |
| Increase the number of midwives through basic training and strengthen the capacity and skills of midwives already trained through continuing education.   | Ensure that all health staff are adequately and appropriately trained in malaria diagnosis, treatment and referral services.   |
| Strengthen human resource planning to reduce mal-distribution of the numbers and type of workforce through identification of posts and the reallocation of staff.   | Identify human resource gaps as they relate to malaria control and influence decision makers to support the filling up of identified gaps  |
| Enhance the management and technical skills and competence of all Ministry of Health workforce through quality, comprehensive training, education, retention and support measures.  | Enhance management and technical skills and competence of all malaria related health staff at different levels in the health care delivery system  |
| <i>Health financing</i>   |  |
| Ensure regular and adequate flow of funds to the health sector especially for service delivery through advocacy to increase resources and   | Identify financial gaps and mobilize adequate funding to sustain the program activities and benefits through   |

**NMCP's Strategic Plan 2006-2010**

|  |  |
|--|--|
| strengthening financial management.  | government and donor support.  |
| Allocate financial resources to improve the accessibility of health services for the poor through alternative health financing schemes.  | Ensure that VMWs are continually supported through products, training and counseling; and ensure the coverage of all hyperendemic and remote areas with insecticidal mosquito nets.  |
| Ensure transparent, efficient and effective health expenditures through strengthening resource allocation, coordination of different sources of funding, and monitoring.   | Ensure transparent, efficient and effective malaria related expenditures through strengthening resource allocation, coordination of different sources of funding, and monitoring.  |
| <b>Institutional development</b>   |  |
| Organizational and management reform of structures, systems and procedures in the Ministry of Health to respond effectively to change.   | Adapt to the changes in health sector reform being initiated by the MoH through sensitization and cooperation of all staff at various levels and through alignment of all malaria related systems and services with the overall health services.                                 |
| Effective public private partnership to improve accessibility, quality and affordability through the promotion of private sector participation and enforcement of regulations.   | Ensure effective public private partnership for malaria control through the promotion of private sector participation (through training, monitoring and collaboration) and enforcement of regulations related to sale and use of malaria products.                               |
| Enhance Ministry of Health capacity to address chronic diseases and emerging public health problems through raising awareness and developing comprehensive plans.  | Sensitize malaria related health staff to the problems posed by chronic diseases and emerging public health problems and raise awareness among affected populations and health care facilities.  |
| Further develop the health sector to strengthen management effectiveness throughout the health service by:<br>a) Enhancing management and leadership culture sector-wide<br>b) Increasing effective decentralization and deconcentration<br>c) Institutionalizing sector wide management | Clarify roles and functions, lines of accountability and decision-making, delegation of authority related to malaria at all levels of the Health System, including CNM, provincial and operational district health offices, referral hospitals, health centres and health posts. |

The Ministry of Health and NMCP are very supportive of the need for flexibility. Therefore in this strategic plan only strategic actions for implementation of the strategies are given. Each level and also each province and (operational) district of the health system will develop detailed actions or activities depending on factors such as role, needs and problems. Such actions/activities will be reflected in annual operational and work plans. The NMCP is implemented as an integrated program comprising of a core MoH supported component fortified with mutually complementary projects supported by donors such as World Bank/DFID, USAID/WHO and Global Fund Round 2 and 4. This long-term strategic master plan (2006-2010) has been prepared in a participatory and evidence based manner so that different donors can buy in and all future proposals and projects could be based on this. The program is implemented on the basis of annual operational plans and provincial work plans which clearly reflect the planned activities against the 4 strategic objectives, objectively verifiable indicators, time schedule, primary responsibility estimated costs and source of funding (MoH, GFATM, World Bank, DFID, WHO, USAID, etc).

## **H. National Malaria Control Policies**

### **1. Preamble**

The Mission of the Ministry of Health, Royal Government of Cambodia is committed to ensure wide equitable, quality health care for all the people of Cambodia through targeting of resources, especially to the poor and to areas in greatest need. To achieve this mission, the ministry has developed a national health policy statement outlining the future directions for the period of five years from 2003 to 2007. In summary, the policy asserts that all people in Cambodia, of whatever gender, age, place of residence or ability to pay, should have equal access to good quality, basic and essential specialized health services, staffed by competent health professionals, and at a cost people can afford; that they should have information that empowers them to make informed choices about matters affecting the health and well-being of themselves and their families. In line with the national health policy, malaria education, prevention, control and treatment services should be universally made available in Cambodia through the implementation of a comprehensive national malaria control programme. The Government of Cambodia is currently overseeing the implementation of a number of policies related to malaria control in the country.

### **2. The Policies**

The National Malaria Policies deal with:

- I. Contribution to poverty reduction in the country
- II. Management structures and responsibilities of key stakeholders
- III. Service Provision
  - ♦ Preventive measures
  - ♦ Vector control, insecticide choice and usage, bed-net treatment with insecticide
  - ♦ EDAT and Treatment protocols
- IV. Financing and Anti-Malarial Drugs
- V. Investment
- VI. Health Information and Research
- VII. Partnership

The malaria policies help in standardizing prevention and control methods and treatment within the country. It is recognized that such policies and guidelines need to be updated from time to time, in line with changing knowledge and situations. Further discussions resulting in recommendations for the National Malaria Control policies are expected to take place in early 2006.

#### **I. Policy on Contribution to Poverty Reduction in the Country**

Since malaria shares a vicious cycle relationship with poverty, the NMCP should therefore prioritize and target the most remote and poverty-afflicted communities for implementing its various interventions, in order to contribute to the achievement of the strategic objectives of the National Poverty Reduction Strategy (NPRS).

#### **II. Policies on Management Structures and Responsibilities of Key Stakeholders**

1. The National Malaria Control Programme (NMCP) at CNM is responsible for providing technical guidelines on malaria health education, prevention, clinical management and control. Its main functions include advisory, capacity building, planning, monitoring, evaluation and research related to malaria control and prevention.
2. The stockpiles for rapid diagnostic dipsticks/ microscopic slides and reagents and antimalarial drugs, for malaria case management at all public health facilities should be adequate and provision to health facilities should be made timely.

3. All public health facilities should report number of malaria cases and deaths on a monthly basis to the HIS, strictly following the standard case definitions as stipulated in the National Guidelines.
4. With technical guidance from the NMCP, the Provincial Health Departments and Municipality Health Departments are responsible for the implementation of malaria control in their respective geographical areas.
5. NGOs are strongly urged to participate in malaria prevention and control activities and to work in close collaboration with the Ministry of Health and NMCP to ensure national policies, strategies and approved protocols for malaria control are being adhered to.
6. Involvement of inter-ministerial and multisectoral collaboration in the prevention and control of malaria should be encouraged and promoted.
7. Epidemic preparedness and response plans for potential malaria epidemics should be kept ready and implemented at the national, provincial and operational district levels.
8. The community should take an active responsibility to eliminate the mosquito breeding sites through environmental manipulation and control, use insecticide treated bed nets and hammock nets, seek early diagnosis and correct and complete treatment and facilitate transport of severely affected patients to the nearest referral hospital.

*The National Center for Parasitology, Entomology and Malaria Control (CNM) assumes overall responsibility for the planning, nation-wide implementation, monitoring and evaluation of the National Malaria Control Program (NMCP) through the health care delivery system in Cambodia.*

The major roles and functions of CNM relating to NMCP are:

- Formulation, monitoring and evaluation of the national policies, strategies, guidelines, protocols and plans for Malaria control
- Organization of continuing training to health workers involved in Malaria control at all levels
- Provision and/or reinforcement of supervision and monitoring of Malaria control activities at all levels
- Organization of surveillance and clinical and operational research on topics relevant to the NMCP
- Promotion of behavior change communication practices for Malaria control
- Development of the National Malaria Reference Laboratory and the network for an effective referral system
- Coordination of Malaria control activities including those conducted by other government agencies, International Organisations, NGOs and the community
- Coordination of partners, mobilization of resources and advocacy
- Contribution to the development of the health care system in both public and private sectors

### **III. Policies & Strategies on Service Provision**

#### **a. Policy**

The National Malaria Control Program should ensure, according to the national protocol and guidelines, good quality, curative, preventive and promotive Malaria services, which are accessible to the community and free of charge.

#### **b. Strategies**

- Malaria diagnosis and treatment at all public health facilities will be free of charge. Where appropriate, subsidization for service provider can be sought through a safety net system (for e.g. equity funds).
- Expand the EDAT strategy to provide good quality curative care by trained staff using hospitalization, ambulatory & home care approaches, giving emphasis on

the implementation of EDAT at health center providing minimum package of activities.

- Employ all appropriate means to improve Behaviour Change Communication (BCC) activities, including such strategies as mass media and interpersonal health education like group education, health education through health facility staff, school, and community.
- Strengthen the referral system from the community level to the hospital level and vice versa, including mobilization of resources.
- Establish laboratory network to ensure accessibility to quality Malaria laboratory services.
- Mobilize resources for the management of Malaria patients and multidrug-resistant Malaria (MDR Malaria).
- Promote public-private partnership, NGO and community involvement in certain aspects of Malaria control
- Identify private health facilities, local and international NGOs, committed to collaborate with the NMCP in the EDAT expansion programme, and to support and monitor the Malaria services provided by them.

#### *Malaria Prevention Policies*

The Government of Cambodia's policy for prevention of malaria comprises of the following:

- Implementation of Information, education and communication approaches using all possible culturally sensitive media and material to change knowledge, attitudes and practices which will lead to better malaria prevention
- Promotion of operational research studies intended to guide policies and programmes for effective prevention of malaria.
- Distribution and promotion of insecticide treated bed nets and hammock nets.

#### *-Vector control policies*

The policy of the government is twofold:

- Free distribution of insecticide-treated bed nets/long lasting insecticidal mosquito nets to the population at risk living in villages situated in forested areas and forest fringes
- Making available through social marketing approach insecticide treatment kits that are required for treating hammock nets for people who are in temporary transit to the forest areas.

#### *-Insecticide choice and usage*

- Insecticides used for malaria vector control should comply with the WHO specifications. The national programme and its partners should ensure their safe, effective and judicious application.
- The insecticide and its type of formulation offered should conform to the WHOPES approved list of insecticides for mosquito net treatment. WHOPES has listed 6 insecticides in its approved list, namely Deltamethrin 1% SC, Alpha-cypermethrin 10%SC, Lambda-cyhalothrin 2.5% CS, Permethrin 10% EC, Etofenprox 10%EW and Cyfluthrin 5% EW
- The actual choice of the insecticide is to be based on cost, effectiveness, absence or minimum toxicity and convenience for transportation and storage.
- The product offered must conform to WHO specifications and the concentration of the active ingredient should be clearly stated.
- *The duration of effectiveness* under normal field condition should be at least 10-12 months

#### *-Bed-net treatment with insecticide/LLIMN replacement*

The policy is to treat the bed nets and hammock nets once every 6 months or at least once a year, in advance of the transmission season. In areas where LLIMNs are distributed, they will be replaced once every three years.

#### **IV. Policies on EDAT and National Treatment Protocols**

- ♦ Ideally, all malaria cases diagnosed in the public or private sector including through outreach and village level volunteers, should be confirmed by microscopy or RDT (dipstick).
- ♦ Quality microscopy remains the gold standard for malaria diagnosis; it should be the main method at referral hospitals and the main tool of epidemiological surveys.
- ♦ Where good quality microscopy exists, the network should be strengthened and expanded to the health center level.
- ♦ In areas with high number of clinical cases, if microscopy is poor or not available, dipsticks should be used with priority to multi-drug resistant areas.
- ♦ In the private sector, patients should have access to good quality diagnosis, either by microscopy or dipsticks, especially in multi-drug resistant areas.
- ♦ For both microscopy and dipsticks, quality assurance programmes should be established.
- ♦ The first line of clinical management for malaria in Cambodia is the administration of the combination therapy consisting of mefloquine and artesunate for falciparum malaria and Chloroquine for vivax malaria, until the next revision of the national diagnosis and treatment guidelines.
- ♦ A printed booklet has been made available detailing the national diagnosis and treatment guidelines. All health personnel, whether in the public sector or in the private sector, should adhere to these guidelines during the clinical management of their patients.
- ♦ The Royal Government's policy is to make the treatment available free of cost in the form of blister packages to all the people who visit public health facilities anywhere in the country.
- ♦ The policy for those patients who visit the private sector is to make available through the social marketing approach, a series of combination therapy blister packages for different age groups.
- ♦ The policy is to have the same artesunate combination therapy available through both the public and private sectors.
- ♦ The policy is to train 1 male and 1 female village malaria workers (VMWs) in each of the malaria hyperendemic remote villages, which are currently unable to access public health facilities, in order that these VMWs render early diagnosis and prompt treatment (EDAT) within their respective communities and thus curtail the otherwise unnoticed severe mortality and morbidity due to malaria.

#### **IV. Policies & Strategies on Financing and Anti-Malarial Products**

##### **a. Policies:**

The Ministry of Health will seek to ensure that financial inputs from all sources for all Malaria control activities are fully mobilized and used effectively and efficiently in Malaria control, and that there is uninterrupted supply of good quality antimalarial drugs, diagnostic dipsticks, slides and reagents, bed nets and insecticide/long lasting insecticidal mosquito nets and other commodities and products.

##### **b. Strategies:**

- NMCP will formulate a 5-year budget plan in line with its strategic plan in consultation with donors, including indication of funding gaps.
- Funds will be fully mobilized to successfully implement the plan.
- MoH will ensure mechanisms are in place for timely disbursement of funds to the NMCP
- The NMCP will monitor current drug consumption, estimate future drug requirement and provide information about anticipated requirement and estimated budget.

- MoH will ensure that there is uninterrupted drug supply to NMCP network.
- MoH will ensure that good quality drugs and consumables are supplied to Central Medical Store(CMS), properly stored and distributed.
- OD pharmacies will be responsible for proper storage and timely distribution to the Referral Hospitals and Health Centers providing EDAT; and also responsible for maintaining the buffer and security stocks and monitoring expiry dates of drugs.
- Health personnel will ensure that antimalarial drugs are used according to the national protocol and should adhere to the rational use of drugs.
- Appropriate action will be taken immediately to correct drug shortages and to prevent similar situation in the future.

## **V. Policies & Strategies on Investment**

### **a. Policies**

The MoH will seek to ensure that priority is given to investment in human and material resources for Malaria control activities.

### **b. Strategies**

- Enhance institutional capacity by strengthening of the management structure at all levels and clarifying the roles and functions of staff involved in Malaria control at all levels.
- Build staff capacity giving emphasis on continuing training according to identified needs.
- Pay attention to workforce planning for Malaria control
- Give emphasis on human resources management, especially staff motivation.
- Seek appropriate technical assistance for better performing the program
- Invest in infrastructure and in logistic support to deliver appropriate Malaria services.

## **VI. Policies and Strategies on Health Information and Research**

### **a. Policies**

NMCP will strengthen the health information system (relating to malaria) and promote research activities in order to better manage the program. Research topics include the epidemiological patterns of the disease, GIS mapping, vector bionomics, health-seeking behavior and other issues related to Malaria in Cambodia.

### **b. Strategies:**

- Improve the recording and reporting system as well as promote the analysis, interpretation and use of information
- Establish and maintain Private Sector Malaria Information System and integrate it with HIS at an appropriate time in the future
- Develop tools for program monitoring, evaluation and supervision activities at all levels
- Enhance information technology (IT) including the use of appropriate GIS software for effective monitoring, planning and evaluation
- Publish monthly bulletins and quarterly newsletters to disseminate information and statistics to all concerned institutions and organizations
- Conduct surveys that are critical for the NMCP such as Malaria Prevalence Survey, Drug Resistance Monitoring, Drug Use Monitoring, etc.
- Identify and plan other studies of similar importance for the NMCP such as the health-seeking behaviors, impact of Malaria on socio-economic development as well as other operational research etc.
- Ensure that the survey/study findings are published, disseminated and taken into account in policy-strategy making and planning processes

- Encourage and support the presentation of the findings at national & international conferences and workshops

## **VII. Policies & Strategies on Partnership**

### **a. Policies**

*Both internal and external partnership should be seen as a core element in achieving NMCP objectives. All resources should be mobilized and coordinated in order to improve Malaria control activities at all levels within and outside the health care system.*

### **b. Strategies**

- Establish appropriate mechanisms of coordination with all partners which include international, government, non-government agencies, private sector and local communities in Malaria control activities
- Network with international organizations involved in Malaria control activities and identify areas of cooperation and funding for the programme.
- Collaboration with organizations, universities and research institutes both within the country as well as abroad. Share experiences and mutual concerns with other countries, in particular through regional and global initiatives such as the Mekong Malaria Forum, RBM initiative, ACTMalaria, SEAMAOTROPED, etc.

## **I. Ongoing Strategic Interventions and Gaps**

Table 11 depicts the ongoing activities and interventions supported by different donors (including GFATM Rounds 2 and 4), the additional interventions proposed under Round 5 GFATM support and the gaps still persisting which need to be addressed through either future GFATM rounds or other donors.

**Table 11: Ongoing Strategic Interventions and Gaps that still need to be addressed**

| <b>Objective #</b> | <b>Ongoing activities and interventions including with GFATM Rounds 2 &amp; 4 support</b>   | <b>Proposed additional interventions with Round 5 GFATM support</b>  | <b>Gaps proposed to be addressed through future GFATM rounds and other donors</b>  |
|--------------------|---|--|--|
| 1                  | 1. Conduct of targeted behavioural research and preparation of comprehensive target group profiles<br>3. Design, production and dissemination of culturally appropriate and gender sensitive IEC materials (print and mass media).<br>4. Training of VHVs (2 per village in endemic areas)<br>5. VHVs undertake health education activities in their own communities<br>6. BCC training of health staff involved in malaria control at different levels<br>7. Training of BCC officers<br>8. BCC training of non-health staff such as military and police personnel, women change agent health educators, key community influencers such as provincial and district governors, commune councils, monks, Health Centre Feedback Committees as well as service providers and users, | 1. Further scaling up of the Community Theatre approach in Preah Vihear province, one of the most hyperendemic and remote provinces in the country<br>3. Further scaling up of the child to child approach (for children who are out of school) in Ratanakiri province, one of the most hyperendemic and remote provinces in the country<br>4. Establishing a Malaria Community Media Network by linking villages to provincial level by providing access to a variety of media. This will be undertaken by HU in Preah Vihear province.<br>5. Integrated media campaign comprising of radio spots and interactive radio programming, to be coordinated by the Women's Media Centre of Cambodia, an organization run entirely by women and the foremost provider of public service broadcasting in Cambodia. | 1. More NGO involvement in BCC activities (e.g. AMDA in Siem Reap, APCA in Ratanakiri, OBE in Battambang, TV programming by WMC, etc.)<br>2. More line ministries' involvement in BCC activities (MoWA, Mol, MoND, MoEYS, etc.)<br>3. Continuation of CNM HED's Round 2 and Round 4 BCC activities in 2009-2010. |

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|   | <p>to promote inter-sectoral collaboration in malaria control</p> <p>9. Development of guidelines for standardization of malaria BCC messages &amp; materials and monitoring tools for BCC activities</p> <p>10. Monitoring and supervision of health education activities</p> <p>11. Scaling up of the Community Theatre approach in selected provinces</p> <p>12. Malaria School health education and child to child approach through collaborative efforts between CNM, Ministry of Education and selected NGOs</p> <p>13. Maintenance of Directory of Stakeholders, IEC data base, development of Reference Data Bank &amp; Resource Centre and linking health education pages to CNM website</p> <p>14. Publication of malaria newsletter</p> <p>15. Malaria BCC for the private sector</p> |  |   |
| 2 | <p>1. Procurement and distribution of ITNs in hyperendemic areas</p> <p>2. Social marketing of hammock nets</p> <p>3. Monitoring and supervision of insecticide treated bed net use</p> <p>4. Procurement and distribution of LLIMNs in remote inaccessible villages and islands</p> <p>5. Social marketing of long lasting insecticidal mosquito nets and insecticide treatment kits in areas where seasonal migration to forests takes place</p> <p>6. Creation &amp; operation of a Revolving Fund</p> <p>7. Integrating malaria with other key health interventions.</p>   | <p>1. Gradual expansion of areas covered with long-lasting insecticidal mosquito nets and simultaneous phasing out of traditional ITNs in Risk Category 1 villages in 18 endemic provinces</p> <p>2. Adoption of fixed-day campaign approach to retreatment of nets in other risk category villages through NGO collaboration during the transitional period</p> <p>3. Enhanced monitoring and supervision of insecticidal bed net use by CNM and NGO partners.</p>  | <p>1. Total coverage of all malaria endemic areas with LLIMNs (additional X number in X villages and additional X pregnant women )</p> <p>2. Sentinel surveillance for insecticide resistance (similar to drug efficacy testing) at selected sites</p>  |
| 3 | <p>1. Procurement and distribution of dipsticks, diagnostic equipment and reagents and prepackaged antimalarial drugs to all the public health facilities</p> <p>2. Ongoing EDAT of malaria in all public health facilities</p> <p>3. Procurement of Malarine and Malacheck</p> <p>4. Social marketing of Malacheck and Malarine branded products throughout the private sector in the country</p> <p>5. Mass media and community communication on early diagnosis and treatment.</p> <p>6. Training of service providers on social marketed products.</p> <p>7. Training and placement of male/female pairs of village malaria workers in 300 hard to access, remote hyperendemic villages</p>  | <p><u><i>Malaria Case Management and Information Reporting through the Private Sector</i></u></p> <p>1. Conduct training needs analysis, and prepare curriculum and training manuals for training of different categories of PPs</p> <p>2. Conduct national and regional training of trainers (ToTs) workshops</p> <p>3. Train PPs in malaria diagnosis, treatment, social marketed products and record maintenance</p> <p>4. Trained PPs provide malaria diagnostic and treatment services to the patients who approach them and record malaria information.</p> <p>5. Introduction of a detailing program to follow up and reinforce training.</p> <p>6. Conduct monthly, quarterly and annual review workshops/meetings at HC, OD, provincial and NMCP levels</p> <p>7. Monitor the services carried out by the PPs</p> | <p>1. Coverage of remaining 8 provinces with private sector malaria information strategy coverage (additional 1600 PPs to be trained and followed up)</p> <p>2. Monitoring of drug efficacy, quality and use in the country</p> <p>3. Improve effectiveness of case management (public &amp; private sector)</p> <p>4. Increase availability and management of RDTs and antimalarial drugs in all public and private health facilities</p> <p>5. Quality assurance of RDTs and microscopy</p> <p>6. Malaria in Pregnancy (BCC, LLIMNs&amp; EDAT)</p> <p>7. Work with private sector (e.g. rubber plantations,</p> |

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|   | <p>5. Ongoing EDAT by VMWs in hyperendemic villages</p> <p>6. Ongoing supervision of VMW activities by CNM and provincial supervisors</p>  | <p>8. Carry out baseline, mid-term and end of the program evaluations</p> <p>9. Continuation of procurement, promotion and social marketing of Malacheck and Malarine branded products throughout the private sector in the country and procurement of 1 year supply of the products.</p> <p><u>Antimalarial Drug Quality Assurance</u></p> <p>1. Procure required number of GPHF-Minilab kits</p> <p>2. Constitute and organize regular meetings of the National Drug Quality Working Group</p> <p>3. Train provincial staff on taking of samples, conducting Thin Layer Chromatographic (TLC) and disintegration tests, record keeping, and reporting.</p> <p>4. Train and sensitize the private providers on drug quality assurance aspects</p> <p>5. Set up of a mini laboratory in each of the 24 provinces.</p> <p>6. Mini-laboratories collect, test and verify confirmation test and report to the national level</p> <p>7. Set up rapid network linking alert system on counterfeit drugs to establish linkages between national and provincial levels and alert private providers and public health facilities on issues related to fake antimalarial drugs.</p> <p>8. Develop posters, TV spots and orient and educate the communities on the dangers posed by the consumption of fake and substandard regimens.</p> <p>9. Conduct intersectoral workshops to support the work of Provincial Drug Management Committees.</p> <p>10. Supervision and monitoring field visits to the private sector facilities and providers</p> <p><u>VMW scheme:</u></p> <p>1. Scaling up the coverage to include additional 100 hyperendemic villages</p> <p>2. Training of the VMWs in handling other childhood illness interventions (diarrhea, ARI)</p> <p>3. Procurement and distribution of drugs and commodities to VMWs.</p> <p>4. Delivery of interventions by VMWs at village level and referral of severe cases to HCs/RHs.</p> <p>5. Supervision, monitoring and mentoring of VMWs by HC staff.</p> | <p>highway construction companies) to protect workers against malaria</p>   |
| 4 | <p>1. Capacity building of CNM and provincial health staff</p> <p>2. Establishment of provincial coordination committees</p> <p>3. Carry out TNA &amp; provide appropriate training to staff at different levels</p> <p>4. Conduct integrated malaria supervision for all referral hospitals</p> | <p>1. Partnership strengthening meetings.</p> <p>2. More rigorous and systematic monitoring and evaluation.</p> <p>3. International technical assistance to assist with the entire planning, implementation, monitoring and evaluation of all key areas of malaria control work and ensure local capacity</p>  | <p>1. Continuation of training and supervision activities in 2009-2010.</p> <p>2. Targeted Operational Research (Clinical, Epidemiological and entomological)</p> <p>3. Performance linked salary incentives for all health staff</p> |

## **NMCP's Strategic Plan 2006-2010**

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| and health centers/health posts<br>5. Support extension of HC outreach activities to support VHVs<br>6. Epidemic preparedness and prompt response | is built to take over the responsibilities in a phased manner<br>4. Recruitment and positioning of additional human resources required for adequate program management including monitoring and evaluation and procurement | involved in malaria control<br>4. Capacity building of Cambodian NGOs in malaria control activities.<br>5. Establishing links for experience sharing and lesson learning with malaria program managers in African and Asian-Pacific nations through exchange study visits, teleconferencing, etc. |
|---|--|---|

### **J. Strategic Goal**

To reduce malaria related mortality by 50% and morbidity by 30%, among the general population in the Kingdom of Cambodia within five years (by 2010) through the implementation of a comprehensive national malaria control strategy.

### **K. Strategic Objectives**

1. To significantly increase community awareness and care-taking practices on malaria prevention and control with promotion of proper health seeking behavior in malaria endemic areas in Cambodia.
2. To improve access to preventive measures that protect the population at risk, with a focus on complete coverage for bed net distribution and re-treatment in targeted malaria endemic areas, employing an effective community based approach.
3. To increase access to early diagnosis and treatment (EDAT) for malaria throughout the country by making dipstick diagnosis and pre-packaged combination therapy available everywhere by means of a three pronged approach involving: conventional public sector channels; emergency EDAT delivered through a network of village malaria workers in the most remote and inaccessible malaria hotspots; and socially marketed products distributed through the private sector.
4. To strengthen the institutional capacity of the national malaria control program at central, provincial, operational district and commune levels

### **L. Congruence with Health Sector Strategic Plan Outcomes**

According to the Health Sector Strategic Plan, five Outcomes are expected from the HSSP strategy. Eleven (11) expected outcomes form the basis of the NMCP Strategic Plan (see Table 12).

Table 12: HSSP Outcomes and corresponding NMCP Outcomes

| <b>HSSP Outcome</b>  | <b>NMCP Outcomes</b>   |
|--|--|
| Improved coverage  | 1. Improved BCC coverage for all high risk situations<br>2. Improved malaria awareness in the general population<br>3. Improved IBNs/LLIMNs coverage in all risk category villages<br>4. Improved coverage of EDAT services in all ODs & HCs |
| Increased utilization of preventive and curative services especially by the poor | 5. Increased utilization of appropriate BCC services.<br>6. Increased access to EDAT, especially for the poor<br>7. Increased access to appropriate IBN/LLIMN services<br>8. Increased utilization of appropriate ..... services             |
| Reduction of prevalence/incidence rates  | 9. Reduction in the malaria prevalence rate to <2.7%   |
| Increased availability of supplies and functioning equipment                     | 10. Increased availability of RDTs, microscopes, laboratory reagents, antimalarial drugs in all HPs, HCs and RHs   |
| Effective referral system  | 11. A referral system that enables severe malaria patients to access appropriate EDATat referral hospitals   |

## **M. Expected Results**

It is expected that with the funds already committed by MoH and donors, as well as those envisaged to be mobilized, by the end of 2010:

1. The coverage of long lasting insecticidal mosquito nets will be increased to ensure that an estimated population of 871,122 living in category 1 risk zone areas out of the total at-risk population of 2 million is completely covered.
2. The VMW project will be fully scaled up to take care of the malaria EDAT & children's diarrhea and ARI treatment needs of the estimated 400 remote and inaccessible hyperendemic villages.
3. A private sector malaria information system will be established and become fully operational with potential integration into the national HIS.
4. A linkage to the National Rapid Alert system (NRAS) on ODDID, being set up with WHO assistance will be established for malaria drug related information in order to alert provincial and operational district health authorities, private providers and consumers about the counterfeit and substandard antimalarial drugs circulating in the country and to undertake prompt measures to halt the menace posed to public health from such drugs.
5. A national drug resistance-monitoring network becomes fully functional with national drug regimens being decided on the basis of the laboratory and field evidence
6. 2400 private providers follow national guidelines in diagnosis, treatment and referral of malaria cases
7. Targeted quantities of the social marketed Malacheck and Malarine products will be procured, distributed, sold and used.
8. A *'people's movement for malaria control'* will be ushered in, strengthened and sustained through cost effective mechanisms, following which communities will adopt sustainable malaria related behaviours and seek appropriate quality treatment from either public or private health facilities according to their convenience and willingness and ability to pay, leading to overall improvements in the health and socio-economic status of beneficiaries.
9. The capacity for planning, implementing, monitoring and evaluating malaria control activities at all levels in the public health sector as well as among governmental, private sector and NGO partners will be further strengthened.

## **N. Strategic Directions for NMCP from 2006-2010**

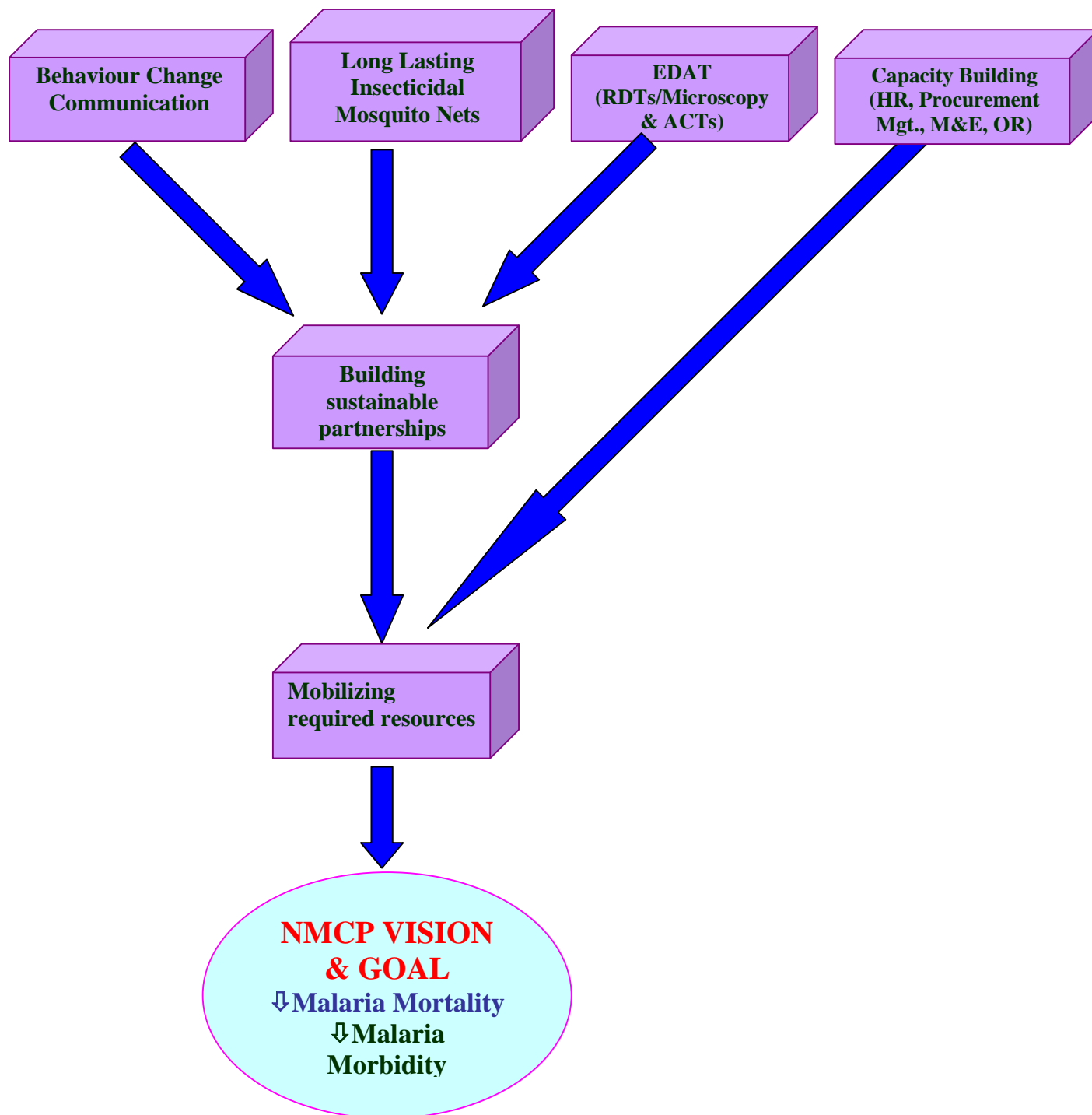
The NMCP is committed to pursue the strategic directions (see Figure 10) of BCC, LLIMN coverage, EDAT expansion, and capacity building, while building and strengthening its partnerships with international and national organisations including civil society, at the same time mobilising the required human, financial and material resources, during the next five years (2006-2010), in order to reach its strategic goal and strategic objectives by 2010.

BCC approaches to be pursued strategically during the next five year period will include both community outreach approaches such as interpersonal and group health education by village health volunteers and female change agent health educators, school malaria health education for teachers and pupils, child to child approach to reach out-of-school children, orientation of village, commune, operational district and provincial level key influencers, malaria health education training of mass media personnel, and use of traditional media such as participatory community theatre.

All the malaria endemic areas will be re-stratified based on the freshly developed risk criteria, and conventional insecticide treated bed nets (ITNs) currently being used in these areas will be gradually replaced with long lasting insecticidal mosquito nets (LLIMNs), as more and more funds that are required are mobilized. During the transitional phase, retreatment of ITNs will be organized through a fixed day approach, well in advance of the onset of the transmission season (i.e. the rainy season). Village health volunteers and village health support groups will be utilized to help with distribution, retreatment/replacement of nets,

health education on proper use and maintenance of the nets and monitoring the actual use. Social marketing of LLIMNs and insecticide treatment kits (ITKs) will be taken up in areas from which there are temporary migrations of peoples into forests.

**Figure 10 : Strategic Directions for NMCP from 2006-2010**



The current three-pronged approach applied in ensuring EDAT throughout the country will be further strengthened through continued clinical research to determine candidate regimens suitable for the country and carrying much less probability of developing drug resistance, suitable and regular updating of national malaria diagnosis and treatment guidelines, training of both public and private health sector providers on the national guidelines, making more robust estimates of requirements of dipsticks and ACTs and other antimalarial drugs and commodities, procurement from manufacturers/ suppliers who adhere to GMP standards, improved drug and commodity management practices (including curtailing the pernicious practice of pilferage of public sector drugs) at all levels down to the health center level, piggybacking diarrhoea and ARI interventions on to the malaria responsibilities of village malaria workers (VMWs), monitoring community drug use practices, establishing and maintaining antimalarial drug (and RDT) quality assurance system and carrying out an all-out campaign against counterfeit drugs, improving referral services especially for severe and complicated malaria case management, etc.

Capacity building efforts will be intensified through needs-based (in-country and overseas) training courses, on the job mentoring, strengthening of the supervision system, monitoring progress against key performance indicators, targeted operational research, carrying out infrastructural improvements, improved coordination and developing broad-based and strengthened partnerships, mobilizing additional finances required to halt the progress of the epidemic by addressing strategic funding gaps, etc.

#### **O. Malaria Intervention Packages**

Malaria interventions to be delivered during the implementation of the strategic plan are grouped into four packages (see Figure 11), with a number of components in each package.

##### *Prevention Package:*

- Behavior Change Communication Programme, including the training and utilization of existing band of village health volunteers, village health support groups, HC feedback committee members, school teachers, pupils and out of school children, community influencers (such as provincial and district governors, mass media representatives, etc.)
- Two complementary insecticide treated net services for high and low risk groups; free distribution of insecticide treated bed nets/long lasting insecticidal mosquito nets in endemic areas and social marketing of long lasting insecticidal mosquito nets and insecticide treatment kits in areas from which there are temporary migrations of people into forests

##### *Early Diagnosis and Treatment Package*

This includes

- Provision of dipstick/microscopic diagnosis and treatment with prepackaged artesunate combination therapy and other antimalarial drugs at all public health facilities,
- Dipstick diagnosis and treatment with prepackaged artesunate combination therapy in hyperendemic villages through VMWs, and
- Social marketing of Malacheck and Malarine products in the private sector
- Recording and reporting of malaria information by private providers
- Establishment and maintenance of antimalarial drug (and RDT/microscopy) quality assurance system
- Strengthening the drug resistance monitoring and setting up a national molecular resistance surveillance center
- Continuing the search for candidate ACTs through drug resistance monitoring studies, update national treatment guidelines based on emerging evidence

Figure 11: Malaria Intervention Packages to be implemented during the Strategic Plan period



*Research and Surveillance Package*

- Malaria Surveillance, improving quality of health information system as it relates to malaria data (including from the private sector) and targeted Operational Research

*Management Package*

- Planning, Resource Management and Coordination of the Programme; which includes decentralization to Provinces, and integration within the health sector
- Monitoring and Evaluation and Reporting on the progress of the Programme and its components

**P. Justification for the strategic directions and interventions chosen for 2006-2010**

*Behaviour Change Communication*

There is a significant gap in culturally appropriate and gender-responsive malaria messages and materials. BCC materials have been principally developed for men who go to the forest, who have been deemed to be the most significant target group (though the highest prevalence of malaria in endemic areas is amongst children under five and pregnant women). Recent studies in the hyper endemic provinces have shown that retention of messages about malaria and pregnancy was very low. There is a need to develop BCC materials that are developed 1) to take account of women's concerns and barriers to getting good information, and 2) to recognize their key roles and responsibilities as the primary household caregivers, and lastly 3) the risk factors that women face. Community participation for malaria related activities has not been generated to the desirable degree, owing partly to the gaps in funding which have come in the way of reaching out to the people with the necessary tools and materials in the most appropriate ways (including the use of traditional media) and partly because the required support from other ministries and agencies has not

yet been mobilized. Detailed plans have been drafted with the active participation of Ministries such as Ministry of Education, Youth & Sports, Ministry of Women's & Veteran's Affairs, Ministry of National Defence, and Ministry of Interior in addition to the involvement of the Ministry of Health and key NGO partners (HU, PFD, PSI, Nomad, CDRCP, ASSAR, and SMCC) and once the GFATM Round 4 funds arrive, communities would be reached with a multi-pronged strategy, ushering in a people's movement for malaria control in the most affected parts of the country. Using village level health volunteers and key influencers, and through a combination of interpersonal communication (targeting vulnerable groups such as women and children through house to house visits, integrated outreach sessions and ANC visits to HCs) and event-centered (such as the celebration of National Malaria Days) campaigns backed up with mass media coverage, the importance of recognizing malaria and adopting appropriate preventive and treatment interventions and practices would be the focus of attention in endemic villages over the next few years. The Cambodia Malaria Baseline Study (CMBS 2004) (conducted with GFATM Round 2, AFRIMS and WHO support) revealed that the % of households who recognize signs and symptoms of malaria ranged from 63.7% to 80% in different geographical domains, the % seeking treatment from trained person within 48 hours ranged only between 36% to 43.8% in different domains, the % of households who are aware of ACTs ranged from 26.8% to 60.9% and the % of households who know that ACTs are effective only with complete course ranged from 20.5% to 23.6%, thus revealing that there are significant knowledge and practice gaps and there is room for considerable improvement through further BCC efforts. Although more than 90% of the surveyed households identified mosquitoes as the main malaria transmitters and mosquito nets as the main preventative tool, yet insecticide treated nets were mentioned by only 10%. This was corroborated by the fact that a mere 7% of the households had sufficient ITNs and just one-fifth (20%) of the people actually slept under an ITN, the previous night, at the time of the survey. More than a tenth of the respondents did not know any signs and symptoms of malaria, clearly indicating the need for awareness raising. Slightly less than half of the respondents had heard of Malarine and/or A+M and only 40% sought treatment from a trained provider within 48 hours of developing a fever, clearly pointing out the gaps in health education. There is definitely a need for CNM's Health Education department to adhere to the recently drawn up BCC strategy, set up a BCC Task Force to oversee and guide CNM and its NGO and line ministry partners, and ensure the effective use of committed financial assistance for this component from GoC, HSSP, GFATM and USAID/WHO by ushering in a "people's movement for malaria" in the country.

Persistent knowledge-practice gaps have been the main reason why the two NGOs, HU and WMC propose to undertake further innovative BCC work through GFATM Round Five support to complement the work (community outreach through participatory community theatre, VHV training, imparting malaria school health education to school teachers, pupils and out of school children, orienting community influencers such as provincial and district governors, mass media representatives, etc.) that are already being planned by CNM, PFD, HU, Nomad, CDRCP, ASSAR, MoI, MoND, MoEYS and MoWA through Round 4 support. It is aimed to further strengthen the BCC approach over the next five years through increased facilitation of NGO partners and related line ministries, in order to extend the reach and impact of IEC activities while still tailoring messages and program delivery to specific target audiences. Specifically, the implementation of GFATM Round 5 programme as part of the Malaria Strategic Plan aims to reach the children who are out of school through child to child approach in Ratanakiri province, 100 villages in Preah Vihear province through community media approach (community theatre) and 60% of Cambodian population through radio spots and interactive radio programming. Within the limited budget previously available, CNM has in the past made efforts to spread the message of malaria causation, prevention, diagnosis and treatment across the communities at risk through traditional print (posters, flipcharts, etc.) and mass media (Radio, TV and newspapers). The Strategic Plan builds on existing BCC interventions and intends to apply them on a much bigger scale than before. At the same time, there have been some new interventions piloted by the NGO sector, such as

participatory theatre, school health and child-to child, all of which deserve to be expanded onto the national level. Together with the traditional interventions, these new interventions can play a key role in reinforcing malaria related messages and stir up public attention towards prioritizing actions against malaria and ushering in a people's movement for malaria.

It is envisaged that the BCC efforts over the next five years would result in empowered communities who not only optimally utilize the wide range of preventive, promotive and curative services in both public and private sectors but also adopt healthy practices that reduce their risk of suffering from the disease and its multiple effects. Freedom from disease and reduction of out-of-pocket expenditure on treatment of the sickness from the disease would in turn enable them to have a better socio-economic status.

#### *Long- lasting Insecticidal Mosquito Nets (LLIMNs)*

The national malaria control program was originally designed as a centrally planned and implemented vertical programme in order to address the emergency nature of the malaria situation in post-war Cambodia. However with the situation coming under control in most areas, the emphasis of the programme began to shift from around 1998 and decentralization of implementation responsibilities to the provincial level was made a priority. Further success of the national programme will depend on a greater devolution of planning, training and monitoring responsibilities to the provinces, operational districts and communes. The current national malaria control strategy is based on the premise that through devolving financial and material resources with associated powers of decision- making and responsibility to provincial and district level through to community level, increased community ownership and accountability of local public health system staff for service provision will be cultivated. Cambodia has had an exemplary bed net distribution program in existence for nearly a decade now. Distribution of bed nets has been integrated with other health interventions such as immunizations, anaemia prophylaxis, and even with distribution of food under World Food Program.

A great challenge to the ITN programme has been to achieve satisfactory coverage and ensure high protection of the target population on an annual basis. The 2004 operational data showed the overall household coverage within 200m from the forest was about 43.3%, ranging from 26.5% in Kampong Som to 91.8% in Battambang (2004 Annual Report, CNM). The CMBS 2004 revealed that while only 30-40% of the population have sufficient bed nets (1 per 2.3 people), 96% of families have at least one net and 92% of people know sleeping under a net prevents malaria. While 84% slept under "any net" (87% of under 5 children and 86% among pregnant women), only 20% slept under an ITN (20% under 5 children and 13% pregnant women), reflecting clearly on the very poor retreatment coverage prevailing in the country. The CMBS 2004 concluded that rather than distribute more mosquito nets or ITNs the programme could achieve most impact for its resources by treating and retreating existing nets, given that net coverage is much higher than treated net coverage.

A clear relationship between socio-economic status (SES) and the number of nets owned has been observed in the CMBS 2004 data; the mean number of nets-per-household is 1.5 in the poorest quintile of households and 2.4 in the least poor household. The CMBS also confirmed that the important barrier to ITN coverage is that these nets have not been treated in the last 12 months. In contrast to nets, ownership of ITNs is remarkably equitable across SES groups. Based on the emerging international evidence that Long Lasting Insecticidal Mosquito Nets (LLIMNs) are a viable and cost effective alternative to conventional ITNs which have been beset with problems of low retreatment coverage, frequent washing, potential problems associated with environmental contamination in the event of improper disposal of containers (and left-over contents) used for treating the nets, and the occasional possibility of excess human exposure to the insecticide; NMCP has begun the gradual replacement of ITNs with LLIMNs. The strategy is to cover all risk category 1 villages with

free LLIMNs in the country with Global Fund support. NMCP's successful GFATM Round 4 malaria component proposal (approved) outlined the intention of NMCP to undertake free distribution of LLIMNs in 410 remote villages in 89 communes in 10 of the worst affected provinces, benefiting an estimated population of 229,987, and replacing the traditional approach of first distributing a free bed net treated with insecticide and retreating the same net at annual intervals in these villages. NMCP's GFATM Round 5 proposal is aimed at the gradual phasing out of traditional ITNs and simultaneous expansion of areas covered with LLIMNs. CNM has proposed to further expand the coverage with LLIMNs to ultimately cover all the hyperendemic villages (categorized as Risk Category 1) in 18 malaria endemic provinces in the country. At the same time, by involving more NGO partners it is intended to step up the implementation, monitoring and thus ensuring better retreatment coverage in areas still covered by conventional ITNs. LLIMN Coverage of remaining risk categories of villages (the stratification is to be revised following the recent availability of Round 2 baseline survey findings) will be attempted through other funding sources and GFATM Round 6. Meanwhile the national government and HSSP budgets will be used to procure and distribute conventional ITNs for the remaining risk category areas. Simultaneously, PSI will social market branded LLIMNs in areas with moderate risk. CNM aims to raise sufficient funds through future GFATM rounds or through other donors, in order to replace the conventional ITNs in villages in risk categories 2 to 4 with LLIMNs. It is hoped that through intense monitoring and evaluation of the use, efficacy and impact of LLIMNs with USAID support channeled through WHO, the MoH may switch from procuring conventional ITNs to LLIMNs in the future and thus sustain the innovative intervention. Currently WHO assists in identifying and verifying risk category areas and monitoring ITN coverage and insecticide resistance. Currently there are about 3,000 Village Health Volunteers (VHV) who have been trained to work for ITN distribution/ retreatment and health education at the community level. These VHVs will be entrusted with the responsibilities of community organizing, logistics, data collection and monitoring of LLIMNs in risk category 1 villages. The volunteers will receive training from the HC staff on LLIMN distribution, proper use and care. They will continue to be monitored and mentored in order to ensure the required community mobilization for the intervention. Supervision of LLIMN distribution and monitoring of LLIMN use will be conducted by Health Center staff in collaboration with the VHVs. CNM's IBN dept. Provincial and Operational District Malaria Supervisors will also be involved in monitoring and supervision, using observational check lists. Monitoring and evaluation are crucial to the ITN programme in Cambodia since ITN operations have been decentralized to the Provincial Health Departments and also integrated with other interventions into Health Center outreach activities.

CMBS 2004 data suggests that a broad relationship exists between distance to forest and malaria prevalence at village level- with a marked drop in levels of infection in settlements located further than 1000 meters from the forest edge. However, many relatively high-risk villages are located beyond a distance of 2 km from forest and there appears to be significant risk of infection in villages situated in risk zone 5 (i.e. in villages more than 1 km from the forest edge). The risk is less than for those closer to the forest, but indicates the need for the control programme to include this zone in its control strategies. These findings will be used to re-stratify the malarious areas of the country into endemic and hyperendemic areas. This stratification will be used to prioritize villages for the purposes of phased coverage of LLIMNs. The aim will be to target all risk category 1 villages with current, committed and already- proposed funding sources, and cover the rest of the villages at risk by future fund-raising efforts. The CMBS 2004 data shows that in Cambodia, pregnant women are less likely to use an ITN than other adult women. This is not the case for nets in general, but it is the case for ever-treated nets. One possible explanation, suggested by qualitative work in other countries, is that fears of chemical toxicity and teratogenicity may be inhibiting ITN use by pregnant women. CNM envisages providing a free LLIMN (coupled with health education) to every pregnant woman living in the malaria endemic areas at the time of her first antenatal

contact, regardless of whether the contact takes place at a health facility or at the woman's home.

This strategy guides the transition, towards a community driven program for vector control and associated health education. It will result in increased community participation and mobilization with capacity to assess, plan and monitor distribution and replacement of Long-lasting Insecticidal Mosquito Nets (LLIMNs) in partnership with health center staff in each catchment area. This will in turn contribute to the goal of reduced malaria morbidity and mortality in Cambodia.

*Early Diagnosis and Treatment (EDAT)*

NMCP's GFATM Round 2 proposal indicated that a three-pronged strategy for Prompt Effective Antimalarial Treatment would be implemented throughout the country; by addressing the diverse problems faced in the public and private sectors as well as the hitherto unmet needs of those living in remote and highly inaccessible hyperendemic villages. Since the commencement of the implementation of the three-pronged strategy through Round 2 GFATM support, NMCP has recognized that there are still further gaps remaining to be addressed, as detailed below.

*VMW Initiative:*

Until the coverage of the health sector improves, village-based therapy offers the only viable solution to the malaria problem in many remote and inaccessible hyperendemic communities. A pilot project evaluating village based EDAT administered by volunteers using low cost highly sensitive rapid diagnostic tests (RDT) and combination therapy prepackaged in age-specific boxes, was initiated in 2001 in 47 communities in the northeast and southwest of the country. The project was a great success and a decision was made to incorporate the strategy into the national plan and expand activities to all eligible communities. Rather than interfering with the Ministry of Health's pre-existing public/private setup the VMW network is complementary, targeting only communities that are geographically or economically beyond the reach of these conventional structures. Findings from pilot studies in Ratanakiri and Koh Kong Provinces showed that these activities greatly reduce the average time taken by people to access health care and lead to a dramatic increase in the numbers of people receiving appropriate treatment for malaria. Within a year and half of time after the commencement of the Round 2 GFATM support, CNM has been able to scale up this volunteer network to cover 300 hyperendemic villages in Cambodia. However, the need to extend the services to at least 100 villages more, and also for piggybacking other child survival interventions into the work of the village malaria workers has recently been realized. Implementation of this strategy will lead to greatly reduced morbidity and mortality in the communities that currently suffer the greatest burden of disease in Cambodia.

*Further work with the Private Providers:*

One of the comments made by the RBM External Evaluation team that visited Cambodia in January 2002 was that "no effective M&E system has yet been put in place and so it is not possible to accurately assess the impact." The NMCP has since then intensified its efforts to put in place an effective and comprehensive M&E system. Part of the support received through GFATM Rounds Two and Four has been earmarked for strengthening the M&E system including the organization of a nation-wide baseline survey that has enabled the NMCP to establish several baseline indicators. Currently the monitoring and evaluation (M&E) of malaria program is essentially based on the health information (HIS) recorded through the fixed public health facilities. However, a cross-sectional study on community drug use practices in malaria (supported by MSH-EC-USAID-WHO) carried out in October 2002 in four Cambodian provinces along the Cambodia-Thai border revealed that the majority of first treatments were obtained in the private sector (62% sought treatment from simple drug vendor, private clinic or pharmacy) and only 18% of first treatments were received in the public sector (government or NGO health facility or village malaria worker). Similar findings

were reported by PSI when they carried out their willingness to pay study in December 2003 (79% sought treatment for malaria from pharmacies and private practitioners as against a mere 17% who visited HCs and hospitals). One of the indicators measured through the 2004 malaria baseline study "Source of treatment and advice" showed that Government health centres and health posts were only used by 16% of the households as against 27.9% who used a "pharmacy / drug shop" and 43% who sought care from a "Private doctor" implying that more than two-thirds actually used the private sector. The remaining 13% resorted to self-treatment, traditional medicines, etc. These findings reaffirmed the previous estimate that 80% patients seek treatment other than at the public health facilities and that most of the civilian cases are treated in the private sector, without adherence to national treatment guidelines and unfortunately no data are available for this group. What proportion of this 80% can be accounted for by repeat visits resulting from therapeutic failures (because of inappropriate treatments) is unclear. It was therefore surmised that despite the best efforts in the public sector, malaria can not be controlled if the NMCP did not give attention to the private sector which is handling around 80% of the fever case load in the country and although a comprehensive social marketing approach is being implemented actively through PSI as part of GFATM Round 2 program, yet the prescription practices of private providers (of prescribing and dispensing sub-standard, poor quality and often fake preparations) have continued unabated, thus pointing out to the need for more complementary efforts in order to ensure that the private sector practitioners adhere to the national treatment guidelines and the use of Malarine® becomes more wide-spread. The GTZ BACKUP Initiative supported pilot project has demonstrated that the approach adopted by CNM in working with the private providers has indeed worked well in the 4 pilot provinces. All the trained PPs filled and maintained the registers provided to them. A total of 9356 cases were recorded in the 4 project provinces during the 6-month period of July to December 2004, by the 199 trained PPs and based on a comparison with the data for the corresponding period from all the public health facilities in these provinces, it may be overall inferred that the crude ratio of malaria cases in the public and private sector is approximately 1:2 (i.e. at least twice the number of cases reported in the public health sector, appear to be seeking treatment from the private sector). A highly satisfactory finding was that either microscopic diagnosis (50.2%) or RDT diagnosis (40.2%) was being carried out by the project PPs as against the 2002 drug use practice survey finding that more than 60% of market and village providers offered no blood tests for malaria. Similarly at least 50% of the malaria cases received ACTs from the project PPs, significantly higher than the 11% of adults who received ACTs in the 2002 drug use practice survey. A local NGO is currently managing the transitional phase of the pilot project.

The RBM External Evaluation team (led by Dr. Richard Feachem) that visited Cambodia in January 2002 identified ensuring quality in the private sector and suppressing counterfeit drugs as some of the future challenges faced by Cambodia. CNM therefore proposes to tackle these problems through a combination of approaches- antimalarial drug quality assurance through the joint efforts of the Department of Drug and Food and CNM and training of private providers in correct diagnosis, treatment, information on social marketed products such as Malacheck dipsticks and Malarine tablets and recording of malaria information through the combined efforts of CNM and PSI with support from other partners and PHDs.

The NMCP is quite confident that scaling up the approach (adopting suitably modified training, monitoring and supervision methods) and simultaneously adopting complementary approaches such as drug quality assurance and social marketing of diagnostic dipsticks and ACTs will bring about substantial improvements in the diagnosis and treatment practices of the private, ensure compliance among patients, reduce the availability and use of inadequate, substandard and counterfeit drugs and contribute to the slowing down of drug resistance in the country. CNM has therefore prioritized the scaling up of the innovative strategy in 12 of the endemic provinces, and establishing key indicators to assess the impact

of the malaria situation in the private sector. Further scaling up in the remaining malarious provinces in the country will be attempted through the submission of a proposal at GFATM Round 6 or approaching other donors.

*Capacity building:*

Organizational, financial and technical systems at both central and provincial level will be strengthened and improved coordination with other government sectors and non-government agencies, will ultimately contribute to a strong institutional capacity to implement quality programs for malaria control that are cost-effective and sustainable. Public Health Care providers will have the capacity to provide quality curative, promotive and preventive care, at both health facility level and through outreach service provision in their target communities. It is expected that, if all hospital, health centre and health post staff, have the knowledge and skills to recognize the signs and symptoms of malaria, have the facilities and supplies available to confirm diagnosis, and the appropriate treatment, according to national guidelines, case management of malaria will be effective. This in turn will lead to a reduction in morbidity and mortality from early diagnosis and effective treatment while minimizing complications of malaria.

*Building Sustainable Partnerships:*

Although the RBM initiative provided the initial stimulus for coordination and partnership development (national, community, public-private) in Cambodia, it must be acknowledged that the arrival of Global Fund support has accelerated the strengthening of the existing partnerships within the malaria field in Cambodia. While the number of partners implementing the Round 2 GFATM malaria program is four, eight more partners have joined the collaborative movement in the about-to-be commenced Round 4 program. Two more new partners (WMC and IPC) are proposing to join the efforts through Round 5 support, which if approved will imply a total of 14 implementing partners. Coordinating the work of diverse partners ranging from health and allied line ministries to international and local NGOs is certainly a major challenge and CNM is proposing to shoulder this coordination responsibility through further strengthening inputs at national and provincial levels.

*Mobilizing required resources:*

Cambodia is a country, where the policies, standards and guidelines relating to malaria control have always been evidence-based and innovation-oriented. Cambodia is one of the first countries in the world to initiate use of diagnostic dipsticks and prepackaged combination therapy and IBNs on a large scale, and the strength of NMCP in this regard has been aptly recognized by the TRP for Round Two Proposals: "Technical strategies well articulated and based on pilot projects, for e.g. dipstick, pre-packaged CT; Social marketing approach based on good local evidence." The national capacity particularly in terms of health systems and human resources is evolving with the country embarking upon health sector reform and undertaking annual joint health sector reviews with international donor support. However, malaria control efforts have lagged behind investments made in infrastructure and equipment, etc. Human rights and gender –related issues are important but not really major barriers for scaling up malaria related interventions. It is the lack of adequate finances that has been the major barrier and thus far limited the scope of the national program and the number of partners who could proactively participate in malaria control. NMCP proposals in recent years submitted to donors have been indeed been to fill existing gaps (of various levels of importance) in the NMCP.

**Q. Links to Sector-Wide Management (SWiM) approach**

Cambodia is currently implementing a Sector-Wide Management (SWiM) approach, which further enhances the collaboration between the MoH and its partners. The Ministry's decision to adopt SWM represents a milestone in what has been to date a largely fragmented sectoral approach and has the potential to assist in strengthening systems and consolidating the

integration of services at the periphery in line with reform objectives. Notably, Cambodia's approach has included developing the first joint sector-wide strategic plan and an expenditure framework. In concurrence with the SWiM, the MoH released its first edition of "Health Sector Strategic Plan 2003-2007" in August 2002. In support of the strategic plan, a conjoint World Bank/ADB/DFID/UNFPA financed Health Sector Support Project (HSSP) for the period 2003-2007 has started its implementation phase. Malaria is cited as a priority in the strategic plan and included as an important component of the HSSP. The adoption of SWiM is likely to have positive effects on the malaria control activities in Cambodia.

## R. Role of malaria-control efforts in the Millennium Development Goals

Cambodia is one of the 191 United Nations Member States that have pledged to meet the MDG by the year 2015. The baseline and target values for the indicators for the Cambodian Millennium Development Goals incorporated into the Health Strategic Plan of the Ministry of Health in 2003 are shown in Table 13 below.

**Table 13: Baseline and target values for CMDG6  
malaria indicators at key time horizons**

| Indicators   | Base year data | Targets |      |      |
|--|----------------|---------|------|------|
|  |                | 2005    | 2010 | 2015 |
| Malaria cases reported rate per 1,000 population in Public Sector  | 7.5 (2004)     | 7.4     | 7.00 | 4.00 |
| Proportion of population at risk who slept under IBN on the previous night   | 57 (2000)      | 80      | 95   | 98   |
| Malaria cases fatality rate in Public Sector   | 0.40 (2000)    | 0.30    | 0.20 | 0.10 |
| Proportion of Public Health facilities able to confirm malaria diagnosis according to national guideline with 95% accuracy | 60 (2002)      | 70      | 80   | 95   |

These indicators will be measured and monitored by NMCP during the implementation of its strategic and operational plans and the successful implementation of the strategic and operational plans of the programme is also likely to contribute to the attainment of the malaria related goals stated in the MDG. By targeting the private sector providers and aiming to change their diagnosis and treatment practices and thus contributing to further morbidity and mortality reductions, this strategic plan in fact goes beyond the scope of the Cambodian MDG indicators (which were set based on the country's HIS which is dependent exclusively on data emanating from the public health facilities in the country).

## S. Links to the RBM Initiative

Even before the advent of RBM, there was a strong national programme with good funding and a collaborative approach with multiple partner involvement (albeit largely donor-driven) in order to reach the more remote and sometimes insecure regions of the country. Cambodia has been very active in the Roll Back Malaria Initiative. It has made optimum use of the opportunities provided through the Initiative to pilot and expand innovative strategies, broadened the partnership for malaria control both within the country and outside, and achieved significant success in halting the rapid progress of the disease in the country. The Malaria Consortium (April 2001) in their analysis on country experiences relating to the RBM initiative in Bolivia, Cambodia, Ghana, Tanzania and Uganda recognized that the Cambodian program had many achievements and outlined the opportunities on which to capitalize, in order to catalyze further the prevailing sector-wide thinking in the country.

Cambodia was chosen as the only country outside Africa which the *RBM External Evaluation Team*, visited at the beginning of 2002. This is what the External Evaluation commented

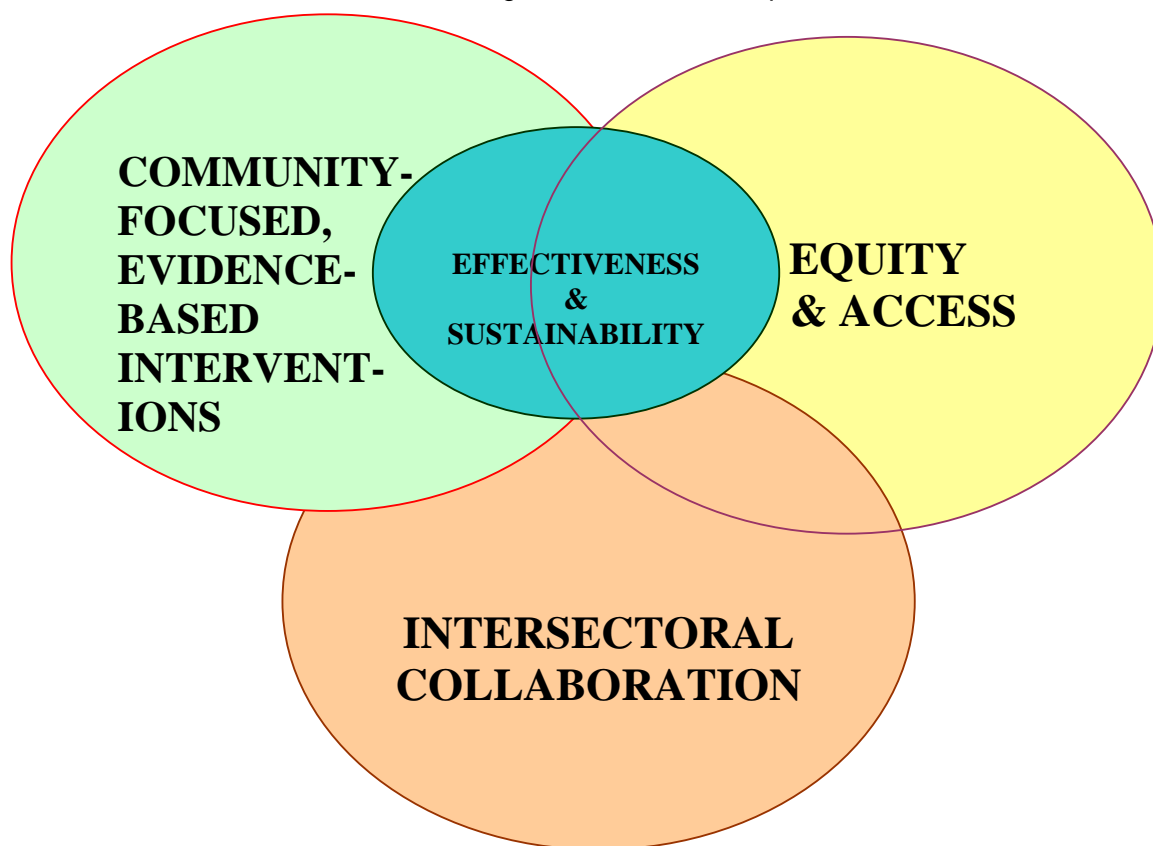
about the Cambodian program: “**Good practice in Cambodia.** In Cambodia, one of the three countries visited by the Evaluation Team, RBM and malaria control were working strikingly better than seen elsewhere..... However, the Evaluation Team was nonetheless impressed by the momentum that RBM has generated. .... These linkages (between RBM and other programmes with overlapping objectives and delivery opportunities) were also being actively promoted in Cambodia. ....It is essential that NMCPs focus on the need to improve the access to and quality of both preventive and curative services delivered through the private sector. The NMCP in Cambodia is doing this”. By increasing the focus on further private sector involvement in malaria control, this strategic plan aims to ensure a more sustained and effective contribution from the private sector to malaria control in Cambodia.

This strategic plan builds further on the scaling up of some of the key strategies recommended by the RBM Partnership, such as complete coverage of at risk villages with Long Lasting Insecticidal Mosquito Nets (LLIMNs), providing EDAT through private, public sector and community channels and IEC through a diverse mix of media and tools, etc. The RBM External Evaluation team (led by Dr. Richard Feachem) that visited Cambodia in January 2002 identified ensuring quality in the private sector and suppressing counterfeit drugs as some of the future challenges faced by Cambodia. This strategic plan prioritizes these two key issues of concern. Appreciating the strategic approaches being pursued by Cambodia, the Secretary General of the RBM Secretariat, Dr.Ewa Marie Coll-Seck, who visited Cambodia in early 2004 unveiled her plans promote exchange of information and ideas between Cambodia and African nations through teleconferencing, exchange visits, etc.

#### **T. NMCP's Principles**

NMCP proposes to implement this strategic plan by adhering to certain principles illustrated in Figure 12 and described below

Figure 12: NMCP Principles



## **1. Community Focused and Evidence-based**

This strategy emphasizes the involvement and inclusion of target groups, and their inclusion during planning, implementation and evaluation of the Strategic Plan, as well as selection of interventions based on the evidence supporting their efficacy and effectiveness. Ethnic minority groups living mainly in the northeastern part of the country, forest fringe inhabitants in different parts of the country, temporary trans-seasonal migrants, and new forest settlers, are particularly vulnerable to this disease. While children under 5 years and pregnant women are particularly vulnerable in the hyper endemic areas, young men (and often young women and children) who visit forests for short periods for economic reasons are at greatest risk in other areas. People living in inaccessible remote rural areas as well as those living in islands off the Cambodian coast are particularly disadvantaged because on the one hand they can not access public health facilities for early diagnosis and treatment of malaria which particularly strikes pregnant women and under five children and on the other, retreatment of bed nets is often poor in these areas for obvious reasons of access. CNM has therefore proposed that GFATM Round 5 support will ensure that the highly endemic areas in the country are completely covered with LLIMNs and VMW services (which will provide add-on interventions against childhood diarrhea and ARI).

IEC materials and methods are currently being developed through the collaboration between CNM and NGOs and employing Participatory Learning Approaches with the affected communities. The further scaling up of the CtoC approach and the staging of Community Theatre performances will be undertaken through the participation of some of the most affected communities with the greatest burden of malaria in the country.

Research in relevant provinces will be conducted to develop the different interventions, and will include research and consultation with vulnerable populations. The ongoing as well as proposed GF and other donor assisted malaria programs will be evaluated using a range of methods that deliberately seek feedback from target populations about the quality, content and effectiveness of the different program components. All evaluations will be carried out after obtaining informed consent from the respondents.

During the implementation of the Round 2 program, certain lessons have been learnt with regard to the VMW project. Although the process adopted in identifying and selecting the VMWs through the extensive participation of the local communities has been hailed by the communities themselves as being highly transparent and democratic, yet some practical difficulties have been faced in the field. The selection criteria to choose two VMWs, one male and one female, (who could read and write) within the same family was found to be somewhat difficult particularly among the ethnic minority communities as most of them are hardly educated as compared to the neighboring Khmer communities living in remote areas. The meeting time set for VMW selection in the communities tended to get delayed as the time for informing the villages had to be extended because the households are scattered, people are engaged in their daily routines in the farm, etc. Another constraint faced during the VMW selection process has been that the relatively better educated villagers declined to participate or volunteer for selection as they felt that they did not need to work as VMWs because they could earn more money or benefit from other jobs. However, once the head of the village provided a clear explanation of the roles and responsibilities as well as the process and encouraged them to participate, several such families came to the fore and involved themselves in the process. Based on these lessons learnt, more rigorous efforts are planned in the implementation of Round 5 program to ensure the effective and proactive participation of the communities and the selected network of village malaria workers. The VMW scheme has been designed on the basis of an operational research project in which extensive consultations were held with the vulnerable ethnic minority populations living in Ratanakiri and Koh Kong provinces. The VMW project is currently subject to annual reviews

using a range of methods that deliberately seek feedback from target populations about the quality, content and effectiveness of the project activities. All evaluations will be carried out after obtaining informed consent from the respondents. Round 5 support will be used to continue and sustain the same approach in estimated additional 100 villages and to handle the single add-on interventions for ARI and diarrhea.

While some of the population groups at greatest risk of malaria have hardly any access to either public or private sector facilities, 80-90% of those who seek treatment services do so from the private sector. However, the private health sector in Cambodia comprises of a variety of players ranging from qualified providers, semi-qualified providers and totally unqualified providers who are often termed 'quacks'. Unless physical infrastructure, socio-economic status and literacy status of the vulnerable sections improve, they will continue to seek treatment for malaria and other health problems from whichever service is nearest to them, even if it means visiting a relatively less qualified and trained provider. Unfortunately, most private providers in Cambodia do not follow any national treatment protocol and treat their patients with incomplete and often sub-standard regimens, including counterfeit drugs, resulting in incorrect and incomplete treatments, treatment failures and high level of drug resistance. It has now been realized that a multipronged strategy is required to safeguard the health of the vulnerable population groups ranging from education and motivation of these groups (using mass media and community outreach) to seek treatment services from trained providers to integrated training of the private providers themselves in malaria diagnosis, treatment, malaria products, record maintenance and referral. This strategic plan envisages CNM's contribution to the operationalization of such a multi-pronged strategy with support from PSI and other NGO partners.

The proposal to scale up the private provider project is the outcome of behavioural research carried with the vulnerable populations themselves, implementation of a pilot project, and drawing lessons for scaling-up from pilot implementation through stakeholder consultations and interviews. It is intended to involve the target groups during the implementation of the project in a number of ways: visits to private providers and obtaining PPs' perceptions and making observations, conducting exit-interviews with malaria patients and their accompanying family members, eliciting community's feedback during baseline, mid-term and end of the program evaluations. All evaluations will be carried out after obtaining informed consent from the respondents.

The partnership established for drug quality assurance with guidance from the National Drug Quality Working Group (NDQWG) will strive to reach large number of private providers through establishing a linkage with the national rapid alert system and provincial drug management committees. An estimated number of 2,400 private providers will be made aware of the types and the dangers posed by fake antimalarial drugs through annual workshops and on the job counseling. The indirect benefit will be that high risk people living in endemic provinces will be able to avoid consuming fake drugs after being sensitized through IEC material and TV education. Private providers will be invited to annual review meetings to share experiences and knowledge related to the dangers posed by fake drugs and will be motivated to educate their patients and their families on the potential sources of counterfeit and substandard antimalarial drugs. CNM staff in collaboration with NDQWG members, local authorities and other stakeholders will supervise and visit targeted private providers and encourage them to prescribe/sell good quality standard products.

## ***2. Equity and Access***

Inaccessibility of malaria-affected communities has been a big barrier and this strategy intends to address this barrier by ensuring that the Village Malaria Worker (VMW) approach is implemented in around 400 remote villages (300 villages covered through Round 2 support and an additional 100 villages covered under Round 5) and at the same time training and equipping all the VMWs (existing and new) in handling diarrhoea and ARI in under five

children.

Women and children living in remote and inaccessible areas are the most underprivileged when it comes to accessing malaria control interventions. When the adult male member falls sick, the family makes the physical and financial efforts to take him to the nearest public or private health facility, however far it may be located. But when women and children fall sick, either they are taken to local healers or given traditional medicines or just left to their fate. This is also a reason why it is emphasized that the HIS (which is exclusively derived from the public health facilities) does not adequately reflect the vulnerability of women and children to malaria in Cambodia. The NMCP has placed special emphasis on treatment of mothers and children during the EDAT training provided to VMWs selected from within the target hyperendemic communities. In order to overcome gender bias, it has been stipulated that one of the VMWs selected in each village should be a woman. By extending the VMW approach to 100 additional villages, it is hoped that existing gender inequities would be further reduced.

GFATM Round 5 support will ensure the total scaling up of the EDAT component through a three-pronged approach that has been built on the principles of equity, accessibility and social acceptability and is already well underway through the support received from Global Fund Round Two. Thus malaria diagnosis and treatment (ACT or Artemisinin-based combination therapy) services will be not only available through every public health facility in the country but can also be accessed in the remotest hyperendemic parts of the country through VMWs who are trained in the use of diagnostic dipsticks and delivering prepackaged ACTs and rectal artesunate suppositories; and through the private sector (from which nearly three-fourths of the malaria patients in the country seek care) through training of private providers and social marketing of subsidized diagnostic dipsticks and prepackaged branded ACTs. For want of access as well as due to non-availability of health staff at public health facilities, a vast majority of malaria patients seek treatment from private providers including a wide range of pharmacies. Some of the private providers do not think twice before prescribing/ administering sub-standard and counterfeit antimalarial drugs. The practices result in incorrect and improper treatments, inadequate treatments, treatment failure and a very high level of drug resistance, hence CNM in collaboration with NDQWG, local authorities and other stakeholders will ensure that private providers are not only trained but also subsequently supervised and mentored and made fully aware of the deleterious effects posed by substandard and counterfeit drugs, as well as recognition and avoidance of all such regimens. At the same time, CNM's health education department will develop and distribute appropriate IEC materials as well broadcast through radio and TV key messages highlighting the need to seek care from trained providers (in public or private sector) and consume trustworthy regimens (either A+M or Malarine) .

All private providers, regardless of their gender, will be trained under the proposed integrated training program. During the training program, special emphasis would be made on the treatment regimens for pregnant women and children.

Women are sometimes deprived of the use of Insecticide treated bed nets which have been distributed on a formulaic (1 net per 2.3 family members) basis, particularly during the peak transmission season, when the men folk go to the forest for livelihood purposes and carry with them the IBNs given free to the family under the program, leaving women and their children vulnerable to malaria attacks. The NMCP has revised its insecticidal net distribution strategy (now revised to 1 net per 2 family members) and with the additional LLIMNs proposed to be procured under GFATM Round 5 program, it is envisaged that pregnant women living in the targeted endemic areas will have guaranteed access to an insecticidal mosquito net as every pregnant mother will receive one LLIMN free at the time of her first antenatal registration either in the health centre or at home (this approach will also serve to increase the antenatal registration rate in the country). The program will utilize community-

based NGO-led antenatal registration systems, wherever available to access pregnant women.

A cross-sectional survey of community drug practices carried out in October 2002 in four Cambodian provinces along the Cambodia-Thai border revealed that 82% of the fever cases go to the private sector (>60% of those in the private sector are village based health providers) for first line treatment, despite the presence of public sector facilities with prepackaged drug combinations available. These findings revealed the need to on one hand ensure the planning and implementation of improved BCC strategies as well as to plan out a more vigorous involvement of the private providers in providing malaria diagnosis and treatment as per the national treatment guidelines for the private providers. Thus NMCP'S GFATM Round 2 proposal avowed that malaria health education efforts will attempt to empower the poor and underserved communities to protect themselves against malaria and seek early treatment at public/private facilities where pre-packaged combinations as recommended by the National Treatment Guidelines are made available through free distribution/subsidized social marketing, when affected by the disease. NMCP's Round 5 proposal charts out a much more concerted and coordinated plan of action to ensure that almost all the private providers in the country's most malarious areas (specifically in 12 provinces) diagnose fever cases with either simple diagnostic dipsticks or good quality microscopy and then prescribe/sell the branded and socially marketed subsidized Malarine. By its very nature, social marketing addresses social equality issues by making critical health products such as packaged malaria treatment affordable to vulnerable segments of the population and easily available through the wide range and great number of retail outlets. PSI proposes to further strengthen Round Two and Four programs with additional concerted efforts proposed to be funded under Round Five support. Support to these efforts will bring about a shift in the balance in the current social inequalities that prevail in the sphere of malaria control.

All the key malaria control interventions will target hyperendemic and endemic communities, which are also the most impoverished in the country. Due to vector ecology, malaria transmission is highest in mountainous and forested areas of Cambodia. These areas are thinly populated and are mainly inhabited by ethnic minority groups. The population of ethnic minorities is around 350,000, divided into 7 non-Khmer speaking peoples, all of which are massively exposed to malaria. The NMCP has therefore specifically targeted ethnic minority groups for combined outreach activities including malaria treatment, vaccinations, Vitamin A distribution and deworming. The village malaria workers initiative has already commenced its operations with Round Two support in 300 hyperendemic villages, which are the poorest and most remote communities in Cambodia. Many are inhabited by ethnic minorities. NMCP's Round 5 proposal envisages the further expansion of this scheme to 100 more hyperendemic villages. It is hoped that such strategies will ease some of the burden that currently falls on some of the country's poorest, especially the ethnic minorities. Malaria health education efforts that have already received a boost with Rounds Two and Four support, need further expansion and filling up of strategic gaps through the proposed Round 5 support and this will in turn empower the poor and underserved communities to protect themselves against malaria and seek early treatment when affected by the disease. The WMC's mass media campaign will directly counteract stigma and discrimination against people living with malaria by:

- Showing that ordinary people can contract and live with diseases such as malaria, that 'people like you and me' can contract this disease.
- Stressing the need for careful prevention and treatment while counteracting blame for those who have contracted the disease.
- Wherever possible involving ordinary people who have contracted the disease as participants in talk back and other live shows where they can talk about their experience.
- Contributing to normalizing malaria – the disease, prevention, treatment and

counteracting cultural beliefs that may attribute different causes, such as past bad behaviour, evil spirits, etc. for the disease.

As the disease burden decreases among the poor and vulnerable sections of the rural communities characterized by limited infrastructure, poor communications and social and cultural barriers, averted treatment costs and wages gained which otherwise would have been lost due to sickness, will enable the communities to improve their socio-economic status.

### ***3. Intersectoral Collaboration***

It has been fully realized that if the scourge of malaria is to be brought quickly under control, the efforts made by the health department alone will not suffice. It is for this reason that the GFATM Round 4 proposal advocated the adoption of a multisectoral approach, involving a variety of key players at various levels (very much in the line of the guidelines issued by the RBM Partnership), through orientation, training and reinforcement of messages.

The success of this decentralized strategy is therefore contingent on a multisectoral approach, whereby other ministries are actively involved in the planning and implementation of malaria control interventions. It is proposed that malaria be listed for discussion in at least one meeting (held preferably before the malaria transmission season) of the provincial coordinating committee for health (Health Pro-Co-Com) in every endemic province, to address the responsibilities of other sectors in relation to malaria control, and enlist their cooperation and support. The Provincial Rural Development staff will be instrumental in cooperating on community needs assessments, environmental sanitation and vector control activities. The Provincial Education staff will be involved with school health education, to include peer education using child-child methodologies, using IEC materials developed for the national malaria program. This approach will ensure that all school aged children will receive education and information, on malaria and other vector borne diseases, which they in turn will share with siblings and peers in their respective villages. The provincial coordinating mechanism will enable all agencies and government staff to contribute towards improved malaria control and prevention for all communities. Coordination mechanisms will be developed for improved multi-sectoral collaboration with other government sectors, NGOs and bilateral agencies for each target province to plan and manage malaria interventions, according to national guidelines.

### ***4. Cost-effectiveness and Sustainability***

All the interventions selected for implementation during the Strategic Plan period have been proved to be cost-effective. According to the Strategic Vision document of the RBM Secretariat (June 2004), LLIMNs "are less expensive per year of protection, when one takes into account both the initial cost of an ITN and the cost of periodic retreatment (insecticide + operational costs)." It is precisely for this reason that the NMCP in Cambodia planned to introduce the LLIMNs in a phased manner in the country, initially in the remotest and inaccessible provinces and islands (with GFATM Round 4 support) and subsequently in other malarious areas as funds become available from subsequent rounds of GFATM or other sources.

The NMCP is currently being implemented with financial support from the Royal Government of Cambodia (mainly for commodities and drugs) as well as from donors such as World Bank, DFID, USAID, WHO and Global Fund (for commodities, drugs, training and operational costs in the field). The bulk of the malaria care deliverers at the periphery are public health staff at referral hospitals, HCs and HPs. They are all paid government salaries. The NMCP is dependent at the village level on Village Malaria Workers (exclusively identified, trained and equipped in hyperendemic villages) and VHVs (already existing); a truly sustainable

mechanism at village level since they are all volunteers and not paid any salaries, but provided with bicycles to facilitate their work at the village level. Salaries have been proposed to donors such as GFATM only for a limited number of dedicated positions within the government and NGO partners, essentially to help in ensuring a greater access to the new interventions such as LLIMNs and ITKs as well as to build capacity at different levels and bring about sustainable malaria related behaviour change among populations living in areas at risk. It is therefore envisaged that once the expected malaria related behaviour change occurs (through the multipronged BCC approaches) and the revolving funds set up for social marketing of key interventions such as antimalarials (under Round 2 GFATM supported program), ITKs and LLIMNs (under Round 4 GFATM supported program) are successfully operated, there will be sustainability of malaria related activities and outcomes. Some of the major costs involved in implementing this five year strategy are related to the procurement and distribution of LLIMNs. However, It is expected that over time, as demand grows, old nets wear out, and world prices decline, the LLIMN will become increasingly available and used by higher-risk populations in more remote markets without the need for a subsidy in the private sector. There will therefore be no need to sustain either the newly created positions or the salaries after the project period is over. If the envisaged reduction in mortality and morbidity are achieved through this program in complementarity with other donor and government funded malaria programs/projects, then the burden of malaria will be reduced to such a level at which the existing expenditure on malaria control spent by government (which indeed quite significant for a poor country like Cambodia) may be sufficient to maintain the control activities and sustain the results after Global Fund grant period.

## **U. Key Activities to be carried out during the implementation of the Strategic Plan**

The following is a broad list of key activities proposed to be implemented during the Strategy Plan period; the list is only indicative and by no means exhaustive. Modifications will need to be made during the annual and quarterly work plan processes.

### **1. Activities for Objective 1. Behaviour Change Communication (BCC)**

- ◆ *Establish a mechanism to regulate the planning, implementation and monitoring of BCC activities on malaria, e.g. constitution of Malaria BCC Working Group within the RBM Technical Advisory Group (TAG).* A broad-based working group will be constituted with representatives from the proposed government and NGO partners, IEC consultants, representatives of HSSP, WHO and National Centre for Health Promotion (NCHP) and with the following draft terms of reference:
  - Advise on all aspects of the *BCC* strategy including research, design, production, dissemination, monitoring and evaluation
  - Collaborate with the National IEC Working Group and other relevant agencies at the national level.
  - Contribute to and support the establishment of a network linking all major stakeholders in malaria IEC activity
  - Identify best practices in malaria *BCC* in Cambodia and advise on updating and dissemination of the same
  - Advise on the setting up of an *BCC* Resource Centre within the CNM
  - Support and contribute to long-term implementation of national malaria *BCC* strategy, coordinated by CNM with stakeholders
  - Develop guidelines for standardization of malaria *BCC* messages and materials.
  - Issue guidelines on budgets for the production of *BCC* materials.
  - Issue guidelines on the process of subcontracting to suppliers for *BCC* production, though each partner shall remain responsible for dealing with their own suppliers.
  - Develop monitoring tools for *BCC* activities, such as supervision checklists, *BCC* return forms and opinion survey forms.

- Develop and oversee the implementation of appropriate training packages for *BCC* officers, service providers and users.
- ♦ *Update the directory of stakeholders in malaria work to identify existing capacity and exploit the principle of comparative advantage.* A directory of stakeholders engaged in malaria work has already been prepared by the HE department through the facilitation work of a consultant supported by GTZ. This will be updated on an ongoing basis by CNM HED.
- ♦ *Appoint and train officers within stakeholder institutions for coordination, monitoring and evaluation of BCC activities.* There will be an initial training course organized in year 1 of the programme and annual refresher workshops thereafter. The *BCC* coordination officers from different partner organizations will meet quarterly, share experiences, review progress and reach consensus on future strategies and *BCC* operations.
- ♦ *Develop and implement a malaria BCC strategy and implementation plan to guide all stakeholders.* A draft *BCC* strategy for malaria control is being currently reviewed by all key stakeholders. Absorbing lessons from the ongoing IMCI *BCC* efforts at applying the BEHAVE framework, and with the facilitation by the consultant supported by GTZ, the IEC strategy will be fine-tuned by end of December 2004. A workshop will be organized in the first quarter of 2004 to disseminate this strategy along with an implementation plan among all key stakeholders in the country. Mechanisms will be established to ensure a high level of collaboration between the National malaria program and the IMCI *BCC* supporting agencies.
- ♦ *Develop a strategy among stakeholders for resource mobilization to support IEC activities.* This work will be ongoing over the next few years with a sustainable strategy for resource mobilization in place by the beginning of 2009. From then on the country should be in a position to sustain the IEC efforts with the funding received from the Royal Government and contributions made by local NGOs and community based organizations.
- ♦ *Develop a reference data bank and resource centre on malaria and IEC messages and materials.* The HED of CNM will be developed as a national reference data bank and resource centre of excellence over the next five years. In addition to the materials prepared in the country, the resource center will also become a repository of materials prepared in other parts of the world.
- ♦ *Conduct baseline and mid-term KPC surveys in selected malaria endemic communities:* Results of program evaluation studies, conducted by EC Malaria, WHO and NGOs<sup>1</sup> in collaboration with the MOH, demonstrates the continued need for strengthening of the national and provincial efforts, towards improved services for malaria control. The predisposing behavioral factors, which contribute to increased prevalence trends in rural communities in Cambodia, have been identified to include lack of information on danger signs of malaria, lack of knowledge on where to access treatment and lack of provision of bed nets in more remote communities. A baseline study is therefore being commissioned by CNM, PFD and HU to obtain similar data for the remaining provinces in 2004 utilizing the funds received from GFATM under Round 2.
- ♦ *Conduct targeted behavioural research:* Rapid research among specific target groups will be conducted to generate information needed for the development of appropriate communication strategies and tools. This research will identify keys to behavioural change and help developers to tailor communication messages and materials to meet the needs of the identified risk groups. The Malaria *BCC* Working Group will identify the target groups in different parts of the country and will assign responsibility among the different partners under Round 4 GFATM program for carrying out a series of rapid qualitative studies to test relevant concepts and areas of perceived threat of malaria and needs of the targeted groups.

<sup>1</sup> Health Unlimited End of Program Evaluation 1998-2002. January 2002.

<sup>2</sup> Partners for Development. Final Evaluation, Northeast Cambodia Community Development Program 1996-2002.

- ◆ *Evaluate existing BCC materials and identify behaviour change gaps to target BCC messages effectively:* HED of CNM will undertake an evaluation of existing IEC materials and identify the gaps with the help of the National IEC Expert (ADB/WHO support).
- ◆ *Prepare comprehensive target group profiles to ensure gender and cultural relevance of messages and materials.* HED of CNM will prepare the target group profiles with the help of the National IEC Expert (ADB/WHO support). They will describe the main ethnic population characteristics based on available information, profiling each type of migrant and mobile ethnic population by age/sex-groups, language, education situation, knowledge, attitude and practices/behaviour related to malaria, and assess malaria risks and vulnerabilities among the different groups.
- ◆ *Develop BCC messages and materials focusing on behaviour change and targeted at the high malaria endemic communities in Cambodia:* A Behavior Change and Communication model (BCC) will be developed by CNM, in collaboration with NGOs and the provincial health staff, using participatory learning and action (PLA) techniques. This BCC strategy will focus on effective prevention measures, early recognition and treatment seeking behaviors, and compliance with treatment. Selected agencies will be appointed to research and develop specific BCC materials that are tailored to the unique needs of ethnic minority groups, low-level literacy populations and other segments of the population who are vulnerable to malaria. The Malaria BCC Working Group, a broad-based entity will issue guidelines on budgets for the production of BCC materials as well on the process of subcontracting to suppliers for BCC production, though each partner shall remain responsible for dealing with their own suppliers. The MoWVA research team will identify target areas and conduct rapid assessment research to identify the main concerns regarding malaria of women in the communities, as well as the main barriers that they face in treatment-seeking for malaria. The team will also issue recommendations for the development of BCI that can incorporate rural women's' concerns regarding malaria. The research will also generate a much needed evidence base on gender inequalities and treatment seeking for malaria. Using participatory research techniques, it will also lead to rural women identifying key areas that are of concern for them for them for malaria. The research will concentrate on 1) women as primary care-givers in the household, 2) women and the risk of malaria during pregnancy and 3) barriers to effective protection and treatment of malaria. This activity will ensure a sound evidence base for the development of gender responsive BCI.
- ◆ *Malaria BCC for the private sector:* Under Round 2, PSI is social marketing through private sector channels a rapid diagnostic test along with an antimalarial combination therapy. PSI was awarded funding of US \$ 1,364,412 (28.72%) out of the total US \$ 4,751,286 for the malaria component for the first two years of implementation. Importantly, round 2 funding also provides significant support to PSI's active program targeting private health providers. This program identifies and trains those private doctors, pharmacists, and drug sellers who provide the brunt of malaria and other health services in the private sector. The proposal in Round 4 is meant to complement that activity by conducting a mass media campaign (through TV, radio, and print) to educate those consumers frequenting private providers. This proposal is seen as a logical extension to its efforts under Round 2 to initially ensure access to quality, affordable products/services before engaging in a wider media campaign.
- ◆ *Generic Communication:* PSI intends to scale up its generic communication effort in the following ways:
  1. *Generic mass media:* Using its own Communication studio, PSI/Cambodia, with technical assistance from the CNM, would develop a series of TV and radio spots, with the objective of improving the health seeking behavior of people who suspect they or a family member may have malaria. This generic campaign would support all the on-going community-level BCC and training activities. Messages would be consistent with the standardized BCC guidelines to be developed by the Malaria BCC

working Group and could include areas such as most frequent symptoms, myths and beliefs surrounding malaria (along with the correct information), correct behavior to adopt. Once pre-tested and finalized, these spots would then be aired on stations that are accessible to target populations.

2. *Fiction film:* Again, through its Communication studio, PSI/Cambodia, with technical assistance from the CNM, would develop a fiction film which would convey through its main protagonists information on the numerous fake regimens that can be found and the proper health seeking behavior that should be adopted when one suspects s/he or a family member has malaria. The film would be developed in a language and style (drama or humor) that would be appealing and accessible to all Cambodians. PSI/Cambodia has a vast experience in developing enter-educational productions including the Golden Wind and Punishment of Love soap opera radio series (the latter which is being adapted into a TV series). This film would be shown on TV as well as through the MVU. It would also be made available on videocassette and/or VCD to partners who conduct outreach activities to target populations. Copies would also be given to commercial venues in the target areas such as restaurants that have TV/VCR/VCD capabilities.
- ♦ *Additional branded advertising and promotional activities:* Some branded advertising and promotion was included in the GFTAM Round Two proposal. However, additional resources for this activity would enable greater coverage of target areas and intensity, which would strengthen customer and trade brand loyalty to Malarine® and decrease demand for inappropriate regimens. Promotional support could also be stepped up by increasing the number of special events, particularly in more remote areas (e.g. such as on National Malaria Day) and the quantity and variety of promotional items for partners to further strengthen brand awareness and confidence.
- ♦ *Translate BCC messages and materials into local ethnic minority languages.* HED of CNM will work closely with the NGO, ICC to translate and replicate all relevant BCC messages and materials into the local ethnic minority languages for use in the north-eastern provinces of Cambodia, which are currently facing one of the greatest burdens of malaria.
- ♦ *Orient key influencers at provincial, operational district, commune and village levels.* Provincial governors and their deputies, district governors and their deputies, commune councils, Village Development Committees (where existing), village chiefs, monks and other key influencers in the community will be oriented on the various important issues related to malaria control and their support will be solicited for spreading the key malaria messages and contributing to the success of specific control measures such as distribution and retreatment of bed nets, identification of village health volunteers (in endemic villages) and village malaria workers (in hyperendemic villages). CNM's HED will undertake the orientation of provincial level key influencers and the PHDs will orient the key influencers at operational district level with support from locally active NGOs. Operational district health chiefs will orient commune and village chiefs and others as well as Village Development Committees (where existing), with support from locally active NGOs.
- ♦ *Train Village Health Volunteers in the dissemination of quality behaviour change communication (BCC).* PRAs will be conducted in each target community, to obtain baseline information, which will guide the planning and implementation strategy for the national program. VHV's will be elected in each village, in the 4 provinces where PFD and HU are implementing partners (with Round 2 funds), based on the national primary healthcare selection criteria for village volunteers, with an average ratio of 1:50 households. VHV's will be responsible for disseminating malaria information and assisting with the re-impregnation and distribution of bed nets. They will also act as resource persons trained in the management of fever and recognition of febrile illness. VHV's will be trained by health system staff, supported by NGO community trainers, in each Health Center catchment area for five days. A total of 1000 VHV's will be trained in Ratanakiri and Preah vihear provinces by HU and a total of 1465 VHV's will be trained in

Kratie and Koh Kong provinces by PFD (with Round 2 funds). The local NGO, CDRCP will implement likewise in 85 villages within eleven communes in the two administrative districts of Anlong Veng and Trapeang Prasath in Odor Meanchey province (with Round 4 funds). Another local NGO, ASSAR-ONG Internationale will implement a similar program in 120 villages within 19 communes located in the operational districts of Phnom Srouch (Kampong Speu province), Toeuk Phos (Kampong Chhnang province), Veal Veng and Kravay (Pursat province), and Koh Krala (Battambang province)(with Round 4 funds). In the remaining provinces, a total of 1950 VHVs/Feedback Committee members will be identified and trained by the PHDs with guidance and support from CNM (with Round 2 funds).

- ◆ *Train key women agent health educators in malaria BCC.* Key women agent health educators in 20 villages per province and in three provinces per year will be trained in giving health education, gender issues in malaria, making referrals and record-keeping. MoWVA staff will coordinate this activity and CNM HED staff will assist in training the women agent health educators. CNM HED staff will also assist in annual refresher training. All women agents of each district and one representative of the related Health Center will attend a monthly meeting organized by the district staff of MoWVA. The central project team comprising of MoWVA and CNM staff will visit the net works at provincial and district levels. They will also talk to the provincial department of health, operational district and health center to ensure that the cooperation is strengthened. They will also visit villagers in one or two target villages to make sure that the program is implemented appropriately and according to the project objectives.
- ◆ *Train schoolteachers in malaria BCC.* GFATM grant will be used to provide support and training initially in the endemic provinces and subsequently all over Cambodia to a total of 1270 teachers in School Health Education (SHE) curriculum and Child-to-Child methodologies, with a focus on malaria control. This will include training (initial and refresher), individual copies of the curriculum, teaching aid materials (1-2 sets per class per school), and intensive follow-up with the teachers, students and their immediate community. In addition, an estimated 1353 provincial educational staff and 150 student teachers at the regional the Teacher Training Colleges (TTCs), will receive a full week training in SHE and also receive copies of the curriculum for use in their schools after graduation. It is estimated that at the end of the program a total of 2643379 pupils will receive instruction in SHE during each school year as a result of this support. Consequently, students will demonstrate an overall increased awareness of health and hygiene issues, and specifically on malaria as indicated by pre- and post-tests administered by their teachers. CNM HED staff and MoEYS/PFD/HU/Nomad staff will form a team of trainers and they will first train Provincial offices of Education (PoE) staff to conduct the training and supervision. They will also provide ongoing technical assistance to the PoE to conduct the SHE in target schools and outreach to communities for child to child health education with the siblings and other peers in the villages.
- ◆ *Training of military medical staff.* 990 military medical staff and Chiefs of units in 8 provinces will be fully oriented on malaria related issues by the Department of Health, Ministry of National Defense with support from CNM HED. In turn the military medical staff will educate over 32,000 troops about malaria prevention and care.
- ◆ *Training of police department staff.* 1055 Provincial Police Health Staff, 228 Chiefs of Dept and Provincial Police will be trained by the Department of Health, Ministry of Interior with support from CNM HED. In addition, 94 Department of Health Staff will be trained as trainers, making 1377, the total number of persons trained over a five year period.
- ◆ *Conduct health education using interactive media and promotion of early referral to health facilities by VHVs.* The VHVs will subsequently conduct health education in their villages and make referrals to the health centers and to private drug sellers as appropriate. Appropriate BCC materials will designed for health education and promotional activities, including flipcharts as teaching aids, sets of cards for teaching

and disseminating health messages with a focus on pregnant mothers and children and demonstration sessions will be held for retreatment of bed nets, and bush clearance around dwellings. Child to child methodologies to be implemented will include more animated methods of teaching and information sharing such as drama, songs, poetry, dance and puppet shows. Support will be extended to the Health Center outreach to the community routinely during integrated outreach sessions and antenatal care visits and exclusively for IEC Malaria campaigns, supervision of VHVs and community surveillance for malaria control and prevention.

- ◆ *Integration of malaria BCC with HIV/AIDS and TB components* will be done at the community level and primarily through the work of NGOs, such as PSI, Health Unlimited and Partners For Development, who are also actively engaged in HIV/AIDS and TB BCC programming both at the local and national level. For example, PSI's mobile video unit, which currently serves remote populations with HIV programming would, using GFATM funds, incorporate malaria funding for relevant populations -- in some cases, where it is sensible, integrating messages within the same MVU presentation. NGOs utilize many of the same community and media channels for all three components, TB, HIV and malaria messages, thus increasing the cost-effectiveness of both interventions.
- ◆ *Develop guidelines for standardization of malaria BCC messages and materials.* The Malaria BCC Working Group (comprising of HED of CNM, MoWVA, MoEYS, NGOs and BCC specialists) will be charged with the responsibility of developing guidelines so that standardized messages and materials on malaria are disseminated throughout the country, by all organizations and across all sectors. The Malaria BCC Working Group (MBCCWG) will address most of the issues in quarterly meetings and subsequently CNM, NGO and other personnel involved would be tasked with the development of specific initiatives and feedback or do a formal presentation of their findings at the next MBCCWG meeting.
- ◆ *Develop monitoring tools for BCC activities, such as supervision checklists, BCC return forms and opinion survey forms.* The MBCCWG (comprising of HED of CNM, MoWVA, MoEYS, NGOs and BCC specialists), will be charged with the responsibility of developing uniform monitoring tools for use throughout the country, by all organizations and across all sectors.
- ◆ *Develop and implement appropriate training packages for BCC officers, service providers, key influencers and users.* The MBCCWG (comprising of HED of CNM, MoWVA, MoEYS, NGOs and BCC specialists) will be charged with the responsibility of developing and overseeing the implementation of appropriate training modules and materials for use throughout the country, by all organizations and across all sectors.
- ◆ *Train provincial/district/health centre level trainers.* HED of CNM will train all the provincial level trainers and these trainers will then in turn the personnel at lower levels. Emphasis will be on the application of participatory methodologies during the training process.
- ◆ *Support capacity building for media personnel to disseminate malaria messages effectively and widely to all sections of the nation.* They will be instructed in the ways to present their material, first to avoid stereotyping and unintended negative effects, and second to enhance and support the main communications programme. They will be trained to be more sensitive to certain factors such as audience segmentation, pre-testing, and evaluation of material impact.
- ◆ *Conduct monthly VHVs and/or HC feedback committee members meetings at the health centers and health posts* (in 13 provinces). The purpose of the monthly VHV meetings is to establish two-way communication between the health facilities and the communities. The village health volunteers (VHVs) /HC feedback committee (FBC) members will provide the vital statistics per village; HC staff will organize a visit in the event of a suspected epidemic. In addition, the bed net distribution/re-treatment plans will be discussed.

- ◆ *Conduct quarterly supervision of VHV/key women agents' activities by trained HC staff supported by NGO staff in the (14) provinces.* Health Center staff in 5 provinces will conduct supervision of village health volunteers with an average ratio of 1:25 volunteers per supervisor, on a monthly basis. They will be assisted in this task by their own supervisors from the provincial/operational district as well as the lead NGO operating in the province. The key women agents will be monitored by the Provincial departments (PDWVA) of the MOWVA in 9 provinces on a monthly basis. Central level MOWVA staff will supervise and monitor activities bi-monthly. The provincial health department will be involved in collaborating with supervision, either through health centers or, in more remote areas, through health posts. The key women agents will also work in collaboration with key health staff in their local areas, with whom they will meet once a month to effectively coordinate activities.
- ◆ *Identify and use appropriate and most effective channels for disseminating BCC messages and materials for specific target group, including more traditional channels.* The NGO, Nomad, will take to scale the implementation of the community theatre performances comprising of Phnong traditional song, storytelling, and dance.
- ◆ *Monitor and evaluate the quality and delivery of BCC messages on an on-going basis.* The BCC sub-component will be fully monitored and evaluated, with the help of a baseline KPC survey, midterm and end of the five-year period evaluation surveys including a specific impact study for the BCC materials. The evaluations will all be contracted out to independent agencies. All the BCC materials will be pretested before replication and dissemination. Training and ongoing monthly supervision of the VHVs will ensure that the materials are used as they are intended by the designers. The forum offered by the Malaria BCC Working Group within the Roll Back Malaria Technical Advisory Group, will be used by all the key partners to review the data collected from routine monitoring as well as through surveys and special research studies and ensure the quality and delivery of IEC messages on an ongoing basis.

## **2. Activities for Objective 2. LLIMN/ITN intervention**

- ◆ *Stratification of at-risk areas:* A baseline study including a prevalence survey was undertaken in the last quarter of 2004 (with GFATM Round 2 and other resources including from WHO) and the draft results are expected before end of April 2005. The findings will be used to re-stratify the malarious areas of the country into endemic and hyperendemic areas. This stratification will be used to prioritize villages for the purposes of phased coverage of LLIMNs.
- ◆ *Listing of beneficiary households:* Provincial and OD malaria supervisors will update the lists of villages, households and number of LLIMNs to be distributed per household with the assistance of HC staff. They will include all new forest settlements as well as "chamkar" areas for the purposes of enumeration. HC staff will fill the requisition order for each village in the catchment's area, and compilations will be carried out OD and provincial levels.
- ◆ *List of expected beneficiary pregnant women* will also be particularly updated at each health center level.
- ◆ *Procure LLIMNs/IBNs and insecticide.* CNM will secure adequate supplies of bed nets and insecticide (with funds from World Bank, GoC and GFATM Round 2) as well as LLIMNs (with funds from GFATM Rounds 4 and 5) for the communities at risk, with a supply chain established through Central Medical Stores (CMS) to reach all Operational Districts. At central level, CNM will be responsible for procurement, supply and maintenance of logistics for bed nets, and insecticide for re-treatment of bed nets. CNM with support from the PR office will procure the required quantities of LLIMNs as per technical specifications recommended by WHO and following the PR procurement guidelines and procedures.
- ◆ *Training of provincial health system staff* in logistics for bed net distribution and re-treatment, will be undertaken by CNM trainers. Links will be established with partner

NGOs and other agencies who support provincial malaria programs for improved distribution networks, particularly for more remote and difficult to access areas.

- ◆ *Distribution of LLIMNs:* A supply chain will be established with the help of CMS to reach all Operational Districts. Training of provincial/OD health system staff in logistics for LLIMN distribution and replacement will be undertaken by CNM trainers. Links will be established with partner NGOs and other agencies that support provincial malaria programs for improved distribution networks, particularly for more remote and difficult to access areas. Distribution of LLIMNs to the remote villages will be undertaken by the NGO, SMCC as part of Round 4 program and by CNM's IBN department under Round 5. The support of WB, WHO and bilateral donors who will assist in providing technical and financial support for the national plan is already secured by CNM.
- ◆ *At the community level,* the program will involve the training of two VHV's per village (1 male and 1 female), who will be responsible for community organizing, logistics, data collection and monitoring of LLIMNs. The volunteers will receive training from the HC staff on LLIMN distribution, proper use and care. Every pregnant woman will receive at the time of her first antenatal contact (either at home or in the health center), one free LLIMN from the health staff of the concerned HC.
- ◆ The dry season will witness a *mass distribution/ replacement* (3 years later in each village considered to be at risk) in accordance with the plan developed for each province and health center catchment area.
- ◆ *Supervision and monitoring:* Supervision of LLIMN distribution and monitoring of LLIMN use will be conducted by Health Center staff in collaboration with the VHV's. CNM's IBN dept., Provincial and Operational District Malaria Supervisors will also be involved in monitoring and supervision, using observational check lists.
- ◆ *Social Market LLIMNs & ITKs:* PSI will develop and market an ITK product (with GFATM Round 4 support) which serves the needs of all at-risk populations regardless of the type of net used (type of net used varies within specific sub-target groups. For example, forest dwellers use both hammock and full-size nets). The product would likely be sold at a subsidized price to ensure that it is affordable to at-risk groups. In order to avoid unnecessary subsidization of the much larger market of net users who are at low risk, the tablet would be targeted specifically to local markets serving at-risk populations. PSI would conduct complementary activities to boost demand for the product and to educate consumers and retailers how to use it. These activities would rely on local media, training, and interpersonal communications. As a longer-term approach, PSI proposes (with GFATM Round 4 support) to create a social marketing brand of LLIMN to establish and develop a bona-fide commercial market for LLIMNs in Cambodia. Given the cost of these type nets and the fact that current, low-income net users are unlikely to discard their old nets, PSI would sell the LLIMNs at cost and make them available to the general net market place (that is, target them initially to people who can afford them, some of whom are at risk, many of whom are at no/low risk). The nets would be distributed through wholesalers and retailers who currently trade in nets in Cambodia. Mass media campaigns would be conducted to create demand for and understanding of the product. It is expected that over time, as demand grows, old nets wear out, and world prices decline, the LLIMN will become increasingly available and used by higher-risk populations in more remote markets without the need for a subsidy. *Train PHD and OD staff in logistics and management of malaria vector control commodities.* Provincial Health System staff will be trained in logistics and management for malaria vector control commodities
- ◆ *Training on the use of ITKs.* PSI will train the United Health Network (UHN, comprising of organizations working at the community level) in social marketing techniques, and provides them with a consistent supply of social marketing products and related IEC/BCC materials and media. Many of these organizations are involved in several health areas, including HIV and TB, creating real opportunities for integration at the community level. Several of these partner organizations, such as Health Unlimited, PFD, and CWPDP, are active in malarial areas. The UHN is expanding and new member organizations, such as

the recently formed SMCC (Society for Malaria Control of Cambodia), will be sought in target areas.

- ◆ *Supervise and monitor the distribution & re-treatment of bed nets.* This will continue as indicated in Round 2 proposal with Round 2 funding.
- ◆ *Supervise and monitor the distribution & replacement of LLIMNs.* This will be the responsibility of SMCC. Replacement will take place in years 4 and 5 of the proposed Round 4 GFATM program.
- ◆ *Supervise and monitor the social marketing of ITKs and LLIMNs.* PSI is committed to undertake the formative research, monitoring and evaluation to ensure that the desired outputs are achieved.
- ◆ *Creation and Operation of Revolving Fund.* PSI proposes to create a revolving fund using revenues from the supplies procured through GFATM Round 4 program in order to replace LLIMN and ITK supplies on a continuing basis.
- ◆ *Integrating malaria with other key health interventions.* PSI's program represents a great opportunity for integrating malaria with other key health interventions, such as HIV, birth spacing, nutrition and clean water. PSI/Cambodia has active programs in HIV and birth spacing and is developing programs in other areas. PSI often utilizes the same channels for distributing products and dissemination behavior change communications. PSI/Cambodia's current and future malaria program benefits from these linkages both in terms of greater cost effectiveness (through shared costs), but also in terms of the enhanced relationship PSI has developed with its partners, including NGOs, the commercial sector, and consumers.

### **3. Activities for Objective 3: EDAT**

#### ***EDAT through Public Health Sector***

- *Procurement, packaging and distribution of dipsticks/slides & reagents and drugs to all public health facilities.* CNM will secure the required dipsticks/slides & reagents and drugs through the procurement efforts of MOH/SMCC, and will ensure their further distribution to all the public health facilities through a well-worked out distribution plan
- *Malaria case management training.* CNM will organize training in malaria case management for all health personnel involved in patient care in years 1 and 3.
- *Diagnosis and treatment of malaria cases at health facilities.* All health facilities with microscopes and trained microscopists will obtain and examine blood slides for malaria diagnosis, while the facilities without microscopes and trained microscopists will base their diagnosis on dipsticks. Treatment of all malaria cases at all the facilities will be according to the national guidelines.
- *Outreach services.* Dipsticks and prepackaged combination drugs would be used by health staff during their visits to villages. Health education with an emphasis on proper use of IBNs would also be imparted as part of the outreach services.
- *Supervise health staff at different levels and monitor progress.* Supervision of all levels of health care delivery system would be carried out using predesigned and pre-tested observational check-lists and followed up with feedback and corrective actions.

#### ***EDAT through VMWs in hyperendemic villages***

- Identify 100 additional highly endemic villages beyond the reach of conventional health care by a combination of analysis of existing information at CNM and PHDs and field visits to likely problem communities. Field visits will be timed to coincide with the dry season to maximize accessibility and allow teams to visit all likely villages as quickly as possible. This is a time when the majority of villages are in their homes throughout the day making it a good time to collect a representative sample of children for splenic palpation. Spleen surveys in 2-9 year-olds will be used as a quick

means of stratifying villages according to endemicity. All communities considered hyperendemic on the basis of these surveys will be selected for inclusion in the VMW scheme.

- Select and train village health workers for EDAT, ARI and diarrhea in identified additional 100 villages as well as for the existing VMWs from round two. Establish within these communities a network of village-based volunteers equipped with RDTs and pre-packaged combination therapy plus ARI and diarrhea treatment kits. Selection, training, monitoring and supply of village malaria workers (VMW) will be conducted by PHD staff under the supervision of a dedicated CNM team according to the successful model established by CNM/ECCMCP in 2001-2. The new Village Malaria Workers (VMWs) will be trained for 6 days with an emphasis acquiring practical skills in undertaking of dipstick testing and administering treatment using prepackaged ACT including ARI and diarrhea treatment. The existing VMWs will be trained for 5 days including the refresher course of EDAT, ARI and diarrhea management.
- The procurement department of CNM to procure and distribute RDTs, ACTs, suppositories, diarrhea treatment kits, antibiotics and paracetamol for ARI, in accordance with PR procedures. The VMW unit of CNM with the help of provincial /OD/HC staff will monitor the distribution to the VMWs and actual use at village level, as is the current practice with in the 300 hyperendemic villages (under GFATM Round 2 program).
- Train HC staff in monitoring and supervising VMWs for the EDAT, ARI and diarrhea interventions. HC staff will undertake monthly supervision of VMWs, who will be further supported by attendance at monthly meetings held at HCs or commune level. Detailed datasets will be compiled so that the situation in these villages can be monitored routinely and reviewed annually. This emergency service will be withdrawn village-by-village once conventional health services become available.

#### **Private Sector Malaria Information Collection:**

- ♦ Recruit, position and manage project staff
- ♦ Design and conduct Training Needs Assessment and identify topics for training (to be carried out in 8 selected provinces)(only in Yrs. 1 and 4)
- ♦ Design , develop and field test curriculum and training manuals for different categories of private providers (Only in Year 1 and in Yr 4)
- ♦ Conduct training of trainers (ToTs) workshops in collaboration with PSI
- ♦ Train PPs and HC staff in malaria diagnosis, treatment, social marketed products and record maintenance in collaboration with PSI. (To increase from 4 provinces in Y1 to 12 provinces in Y2; refresher training will be conducted in all the provinces annually thereafter)
- ♦ Design and print registers, caps, T-shirts and other promotional materials
- ♦ Distribute registers , referral slips for recording of malaria related information to private providers
- ♦ Distribute health promotional material to private providers
- ♦ HE department to ensure private providers are targeted through the mass media campaigns launched at provincial level
- ♦ Ensure trained PPs provide malaria diagnostic and treatment services to the patients who approach them and record malaria information
- ♦ Collect information from PPs on a monthly basis
- ♦ Monitor the services carried out by the PPs
- ♦ Conduct annual review workshops/meetings at national level
- ♦ Carry out baseline, mid-term and end of the program evaluations

#### **Antimalarial Drug Quality Assurance**

- ♦ *Procure the GPHF-Minilab kits.* GPHF-Minilab kit will be procured in a phased manner from Germany for conducting screening tests on drug samples and will

be provided in each provincial laboratory. PR, CNM and WHO will assist and support the process of procurement (USP DQI may facilitate the process). The kits will be purchased from GPHF and provided to the provinces within the first quarter of each year in a phased manner (Year 1=5, Year 2= 8, Year 3=9) (3 mini-labs have already been set up with USP support in 2003)

- ◆ *Conduct TLC training at CNM/NLDQC and practice.* Provincial drug and food safety unit and malaria supervisor in each province and National Drug Quality Working Group (NDWG) will be rigorously trained in the proper TLC method and disintegration test of GPHF-Minilab kit, sampling method, GLP as well as in recording the drug information on a regular basis following USP/DQI SOP, 2003 within technical support by NL, GPHF and USP/DQI. 72 provincial staff and NDWG members will gain knowledge and skills on simple antimalarial drug quality testing. The trainees will be trained by experts from GPHF and USP/DQI in second/ third quarter of year 1, year 2 and year 3.
- ◆ *Conduct and monitor quarterly collection and analysis drug samples from drug outlets.* The estimated number of drug outlets visited and number of drug samples collected (target: Year1= 180, year 2= 260 and year3= 350, year 4= 370 and year 5=370). The need the USP DQI in USA and BND in Thailand for close collaborate to confirm the drug samples in case needed.
- ◆ *Set up the mini laboratory.* The provinces will be provided with computer sets and implementation guidelines will be communicated to provinces within third quarter of each year in a phased manner (Year 1=7, Year 2= 8, Year 3=9).
- ◆ *Develop IEC messages to disseminate to stakeholders and private providers.* Appropriate IEC messages will be developed by Health Education department of CNM and distribution of posters, printed picture of fake drugs will be used in mobilizing community opinion against counterfeit drugs. Broadcast TV spot and send message to educate people to proper drug use.
- ◆ *Conduct annual review workshops/meetings at provincial and NMCP levels.* Annual seminars/workshops will be held involving all the key stakeholders to take stock of the progress and agree on annual plans.
- ◆ Supervision and monitoring field visits to the private sector by the committee and inspection team
- ◆ Gradual enforcement of drug laws and regulations through integration of law enforcement bodies to work together toward addressing effectively the problems of counterfeit and substandard antimalarial drugs as well as the other pharmaceuticals.

#### **4. Activities for Objective 4: Capacity building**

- ◆ *Capacity building of CNM and Provincial health staff to plan, implement and monitor the national malaria program with effective and efficient deployment of human and financial resources at all levels.* CNM in partnership with WHO and implementing NGOs, will respond to the gaps in human resource development, through training for public healthcare providers on management and planning for malaria programs. Based on current human resource assessments, training on planning, financial management and communication skills for improved multisectoral collaboration is required to ensure effective and efficient program implementation. CNM will develop and deliver technical training on program planning, malaria case management, laboratory diagnostics, logistics and reporting to health system staff in all malaria endemic provinces. This will be further supported by WHO and NGO inputs at both national and provincial levels for improved surveillance, operational research on drug resistance and improved treatment protocols and guidelines.
- ◆ *Establish provincial coordination Committees.* The success of this decentralized strategy is also contingent on a multisectoral approach, whereby other ministries are actively involved in the planning and implementation of malaria control interventions. It is

proposed to establish provincial coordinating committees for malaria in each province, to address the responsibilities of other sectors in relation to malaria control. The Provincial Rural Development staff will be instrumental in cooperating on community needs assessments, environmental sanitation and vector control activities. The Provincial Education staff will be involved with school health education, to include peer education using child-child methodologies, using IEC materials developed for the national malaria program. This approach will ensure that all school aged children will receive education and information, on malaria and other vector borne diseases, which they in turn will share with siblings and peers in their respective villages. The provincial coordinating mechanism will enable all agencies and government staff to contribute towards improved malaria control and prevention for all communities. Coordination mechanisms will be developed for improved multi-sectoral collaboration with other government sectors, NGOs and bilateral agencies through introduction of a coordinating committee for each target province to plan and manage malaria interventions, according to national guidelines.

- ◆ *Undertake a Training Needs Assessment in each province, to determine current human resource capacity and to identify gaps in technical knowledge and skills for management of malaria programs.* At provincial level the preliminary stage will involve conducting a Training Needs Assessment for all referral hospital and health center staff in collaboration with the Provincial Malaria staff. CNM trainers, in partnership with NGO staff will subsequently train all RH and HC staff involved in clinical consultation, on diagnostics and treatment protocols for Malaria. This will be augmented by in-service case management training by NGO medical staff and OD supervisors, which will include coaching and mentoring of key consultation staff. Supervision and follow-up, vital parts of the capacity building process, will be conducted for all referral hospital outpatient and HC staff monthly by PHD/OD Supervision teams. Peer review and case study analysis will also become an integral part of the supervision process and will foster improved HIS management and serve to strengthen case management for malaria and other diseases. PHD supervisors will be responsible for Referral hospital and HC supervision using MOH Integrated checklists for CPA and MPA services. This will further strengthen the capacity of OD and HC staff for more effective case management of malaria.
- ◆ *Provide technical training on laboratory diagnostics, logistics, case management, EDAT and HIS for provincial health staff at referral hospital, health center and health post levels.* Refresher training will be conducted annually following the initial foundation training for all referral hospital and health center staff. Quality improvement of health services will also be addressed through implementation of quality improvement tools such as the COPE strategy (Client Oriented Provider Efficient). This tool and process attends to staff attitudes, teamwork and motivation to meet the needs of the clients as well as those of health providers. COPE involves training of PHD/OD staff who in turn become facilitators of the strategy at each health facility. Results of employing this tool in Cambodia's public health facilities to date has proven highly successful, with HC staff demonstrating enhanced problem solving skills and more effective use of the limited resources available at HC level.
- ◆ *Professional development of CNM and PHD staff.* In collaboration with WHO, DFID and NGOs, identify and deliver more professional development courses and foster exchange visits for central and provincial health staff.
- ◆ *Conduct Integrated Supervision* for all referral hospital and health center/health post staff according to MPA and CPA guidelines with opportunities for peer review and use of quality improvement tools to complement the supervision process.
- ◆ *Support the expansion of health center outreach activities to support to village health workers conducting IEC campaigns and ongoing health education for malaria control and prevention.* In order to increase utilization of health centers and promote early referral of complicated malaria cases community outreach will be supported in malaria endemic villages. The twofold process of outreach health education and supervision of VHVs will be conducted monthly by HC staff. Health centre feedback committees (already selected and trained) will participate in the monthly meetings and share feedback data collected at

village level with HC staff. The strengthening of these links and the chain of referral from communities to health center and onwards to referral hospital will ensure that patients will receive appropriate and timely treatment for malaria. With increased access to quality healthcare and delivery of early diagnosis and treatment, it is anticipated that a significant impact on reduction of malaria morbidity and mortality will be manifest by 2007.

- ◆ *Epidemic preparedness and prompt response* In addition the VHV/HC feedback committee will inform HCs if the number of malaria cases in their communities starts to increase and by prompting timely investigation and where appropriate intervention should help to avert malaria epidemics.

- ◆ *Coordination and Partnership Development:*

- a. Partnership strengthening meetings: CNM will conduct periodical coordination meetings with partners. The aim will be to achieve more effective coordination of around 20 malaria partners (Rounds 2, 4 and 5 and others) and with national and international organizations.
- b. Constitution of Technical Task Forces, Working Groups, Implementation Committees, etc.: CNM will assume leadership and collaborate and coordinate with the other SRs not only during proposal drafting stage but also during program implementation stage; constituting special task forces and working groups, establishing performance standards, establishing baseline data (secondary as well as primary through surveys), monitoring and evaluation of processes, outputs, outcomes and impact. Technical Task Forces, Working Groups, Implementation Committees, etc. will be created to ensure common standards, consensus on key issues of implementation, avoidance of duplication, etc. The capacity for planning, implementing, monitoring and evaluating malaria control activities at all levels in the public health sector as well as among governmental, private sector and NGO partners will be further strengthened.
- c. Drafting of long term strategic plans and annual operational plans. CNM will work with other partners in defining and refining the long term strategic plan for malaria control in the country and will provide capacity to the provincial and operational district health authorities in formulating annual and quarterly operational and work plans and budgets.

- ◆ *Human Resources*

- a. International technical assistance to assist with all key areas of malaria control work and ensure local capacity is built to take over the responsibilities in a phased manner. The aim is to enhance the capacity of 60 staff at CNM and to ensure that 24 provincial teams and 75 OD teams are further strengthened.
- b. Recruitment and positioning of program management staff. Additional staff to look after M&E responsibilities and procurement processes will be recruited. The additional M&E staff will ensure that supervision of all levels of health care delivery system would be carried out using predesigned and pre-tested observational check-lists and followed up with feedback and corrective actions. The procurement officer to be recruited will ensure that the required dipsticks/slides & reagents and drugs and other products and commodities are procured through the procurement efforts of MOH/PR/CNM, and will ensure their further distribution to all the public health facilities through a well-worked out distribution plan.

- ◆ *Monitoring and Evaluation*

Effectiveness of interventions will be measured at baseline, mid-term and end of the project, guiding policy makers, program managers & implementers. Appropriate mid-course corrections in program implementation will be undertaken. Further, lessons for policy/strategy reformulation will be fed back to the Ministry of Health and followed up with action.

## **Chapter 5**

### **Monitoring and Evaluation**

#### **A. Overall Approach to M&E**

NMCP prioritizes data collection through a variety of methodologies. Baseline, Mid-term and End-line quantitative and qualitative surveys will be carried out.

CNM along with partner NGOs from Round 2 Malaria component program will contract in 2006, an independent agency to conduct a countrywide mid-term evaluation to assess the progress made with regard to malaria knowledge levels and prevention and treatment practices as well as cross-sectional surveys to determine epidemiological prevalence for malaria. This survey will also be used as a source for comparing progress made against some of the key indicators incorporated into the Round 4 Malaria component program. Since some of the Round 5 indicators will need separate indicators, additional resources have been sought in order to ensure that the 2006 survey doubles up as the baseline survey for Round 5 program in addition to measuring progress of Rounds 2 and 4 programs. An end of the program evaluation for Round 2 program conducted by an independent agency is due in 2008 and this will also serve as the mid-term evaluation for Round 5 program, with the required additional resources. An end of the program evaluation for Round 5 program, again to be contracted to an independent agency will be conducted in 2010, and has been appropriately budgeted under the Round 5 proposal. The results of all evaluations will be shared with stakeholders, at provincial and national level in Cambodia and with donors, NGOs and important academic and research organizations.

Ongoing monitoring will continue through the organization of annual sample surveys and supervision visits to health facilities. This will reveal the qualitative impact of the interventions. The HIS, PSMIS and Community surveillance data (generated through the VMW project) will determine impact on malaria prevalence in the different provinces. CNM reports to the Health Sector Support Project (malaria component funded by World Bank and DFID) every quarter on a set of mutually agreed coverage and impact indicators. CNM submits to the Planning Department of the Ministry of Health data pertaining to the "Health Service Delivery Indicators" numbers 34 (Malaria severe case fatality rate) and 35 (Malaria incidence rate), which are reviewed as part of the Joint Health Sector Review annually.

#### **B. National and Malaria Program M&E systems and structure**

CNM will request the Ministry of Health to include malaria indicators to the extent possible in all the future National Surveys (for e.g. Cambodia Demographic and Health Survey). The existing health information system (HIS) set up by the MOH provides information on malaria morbidity and mortality. Despite the incomplete nature of information provided, the data obtained is still considered valuable since it provides reliable broad trends in morbidity and mortality in the public health sector. CNM will liaise with the Planning Department of the MoH, to modify the reporting formats at various service facilities in the country in order to derive optimum information relating to malaria morbidity, mortality and other relevant impact data. In order to fill the information gap in the private sector, where around three-fourths of malaria cases are estimated to be treated every year, CNM together with its partner PSI will be taking to scale the highly successfully piloted private sector malaria information collection strategy and setting up a Private Sector Malaria Information System (PSMIS). In order to ensure ownership and sustainability of the approach, data transmission will involve public health functionaries right from health center upwards all the way to the Planning Department of the MoH. Further, in addition to sensitizing and alerting the general public about the grave dangers posed by fake and substandard antimalarial drugs circulating in the public and private sector, linkage of antimalarial drug information to the national rapid alert system

(NRAS) involving all the twenty four provincial authorities is proposed to be set up with Round 5 program support.

The NMCP has a history of ensuring sound monitoring and evaluation systems are in place before commencing any new project/program of work. The five-year Strategic Master Plan drafted by CNM, the nodal agency responsible for managing the NMCP, emphasizes the importance of M&E in the efficient and effective implementation of the 4 major national programs that the institute has been made responsible for by the Ministry of Health. It has in its current programs and past projects used regular tools for monitoring such as maintenance of proper and relevant records, interviews with the beneficiaries in the field, and followed up of the activities with monitoring and supervision checklists. Different levels of functionaries involved in the implementation of the program have been assigned specific monitoring and reporting responsibilities under each program and trained. CNM also identifies an overall in charge for monitoring and evaluation for every program that it implements. CNM staff are familiar with the use of computers and software such as Excel, Epiinfo, Strata and SPSS and have used these to good effect in the programs previously handled. CNM has in recent years been appreciated by the MoH as well as donors and other key stakeholders in Cambodia for its regular and succinct reports. CNM implemented projects have had an end of the project external evaluation (or internal) demonstrating clearly the extent of achievement of results/activities and impact. CNM has also the history of commencing implementation of its different programs with a baseline survey, in order to ensure that its program is not only efficient and effective but also improves the overall situation of the beneficiaries.

Currently the different departments and units in CNM submit their information, including achievement on the planned targets on a quarterly basis to the Technical Bureau, who then compile the information and publish the quarterly and annual progress reports. The Epidemiology department collects from the Planning Department of the MoH the monthly malaria related data drawn from the public health facilities and scrutinized, compiled and submitted by different provinces. From time to time, the MoH requests the CNM for interim progress reports on a variety of issues and the Technical Bureau with the help of the respective CNM departments, collects the information on the prescribed formats, compiles the data and finalizes and submits the report after a review by the Director and CNM technical advisors.

### **C. Strategy for quality control and validation of data**

Quality control will be built into the various methodologies and tools used for monitoring and evaluation process. Monitoring and supervision of all program activities will be routinely carried out and the data will be scrutinized very carefully at each higher level to which it is reported within the National Malaria Control Program (NMCP). Triangulation of data collected through the routine reporting will be made with the help of surveys and household and exit interviews with the different beneficiaries and their families.

The major emphasis in the next five years will be to improve the reliability and regularity of the reports received from the national HIS. CNM will collaborate with the MOH to ensure that appropriate and relevant malaria related information is obtained from the national HIS. This proposal will also ensure that information from the private sector as well as other departments such as the defense are incorporated into the national level malaria database. Quality review of the different surveys will be undertaken with the help of the international technical advisors available to CNM.

### **D. Strengthening M&E capacity**

“Health Service Delivery Indicators” numbers 34 (Malaria severe case fatality rate) and 35 (Malaria incidence rate), which are reviewed as part of the Joint Health Sector Review annually, pertain to malaria.

- ◆ The resources provided by the Global Fund Round 2 Malaria component program are already being used to build capacity, to improve CNM's M&E system and to ensure that all reports will be accurate and timely. Further support to CNM under Round 4 program has been mobilized to ensure the adoption of standardized monitoring and evaluation systems among the partners. The Malaria BCC Working Group within the Roll Back Malaria Technical Advisory Group (MBCCWG, comprising of HED of CNM, MoWVA, MoEYS, NGOs and IEC specialists) has been charged with the responsibility of developing uniform malaria BCC monitoring tools for use throughout the country, by all organizations and across all sectors.
- ◆ CNM has begun to provide the required capacity building and mentoring support to its sub-sub-recipients under Rounds 2 and 4 programs and this process is proposed to be continued during 2009 and 2010 with support received from round 5 program. CNM's long-term international advisers currently play a significant role in all the capacity building efforts within CNM and its sub-sub-recipients including the PHDs.
- ◆ Malaria related training of provincial, operational district and health center staff as well as different categories of private providers will include malaria information recording, collection, compilation, analysis and interpretation.

#### **E. Private sector malaria information strategy and its role in malaria M&E**

The very purpose of piloting of a private sector malaria information strategy in Cambodia has been to fill the existing gap in the National Health Information System which currently measures the burden of malaria disease handled by the public health facilities alone. It may be pointed out that nearly three-fourths to four-fifths of the total malaria cases in the country seek treatment from the private providers in the first place. Under such circumstances, the national HIS data reflects only part of the malaria burden faced by the country. By successfully piloting the private sector malaria information collection strategy (with GTZ BACKUP Initiative support), CNM now proposes to scale up the approach in the entire country. Well-trained staff are already in position in CNM to undertake this responsibility and additional appropriate staffing requirements have been identified and budgeted under this proposal.

It is envisaged that the current transitional phase of the private sector malaria information project (currently funded by CIDA) and implemented by a local NGO partner will yield the following specific outputs:

1. Refined and ready-to-implement locally appropriate strategy for the collection, compilation and analysis of malaria information from the private health sector in Cambodia
2. Transition phase process report, monitoring and evaluation plans and two year work plans and budgets for scaling up the implementation of the strategy with Round 5 GFATM support
3. Enhanced technical capacity and more evidence based monitoring and evaluation within the local NGO implementing the transitional phase
4. Enhanced evidence based decision making within the national malaria control program based on the data provided by the local NGO on a regular basis
5. Sustained interest demonstrated by project staff and private providers as evidenced through correct diagnosis and treatment and regular and reliable recording of malaria information until the end of the transitional phase

One of the comments made by the RBM External Evaluation team that visited Cambodia in January 2002 was that “no effective M&E system has yet been put in place and so it is not possible to accurately assess the impact.” This is precisely the reason why CNM prioritizes baseline, mid-term and end of program evaluations in addition to periodical monitoring and

supervision activities at all levels down to the endemic villages. Cost estimates for the baseline, mid-term and end of the program evaluations are based on the experiences gained in organizing baseline survey for Round 2 malaria program. Baseline, mid-term and end of the project evaluations are planned and budgeted under this proposal in order to monitor progress, draw lessons, institute appropriate mid-course corrections and ensure achievement of key objectives. The indicators to be measured will be for the whole malaria program (funded through MoH, HSSP, WHO/USAID and different Rounds of GFATM) and not just for the GF-funded malaria component. Harmonization of indicators will be attempted, as has already been the case with the recently concluded baseline survey 2004 (Funded under GRATM Round 2 program). Round 2 evaluations have been under budgeted and money from Round 5 program M&E budget allocations will be pooled together with those from Round 2 to ensure adequate sample size and measurement of progress on key aspects of NMCP.

Routine monitoring on a quarterly basis has been proposed and this will ensure that feedback to peripheral levels is provided promptly and feedback received is acted upon expeditiously. The private provider project staff will submit regular quarterly, semi-annual and annual reports in the prescribed formats to CNM and attend all the RBM TAG meetings that are convened on a quarterly and annual basis and share their experiences with other partners.

#### *Flow of Data Collection*

Starting from the very basic level, Health Center staff will be required to collect the information from private practitioners, who deal with their patients and record information in the standard registers provided to them on a monthly basis. Health Center staff may enlist the support of local NGOs or grass-root level community organizations in this task. The HC staff will then transmit the data to the OD malaria supervisor/person in charge of HIS. After monthly compilation, they will then transmit the data to the provincial malaria supervisors, who will then analyze the data and send the data along with a monthly report to CNM. CNM will in turn submit the information to the Department of Planning in the Ministry of Health. Figure 12 illustrates the proposed flow of malaria information recorded by private providers.

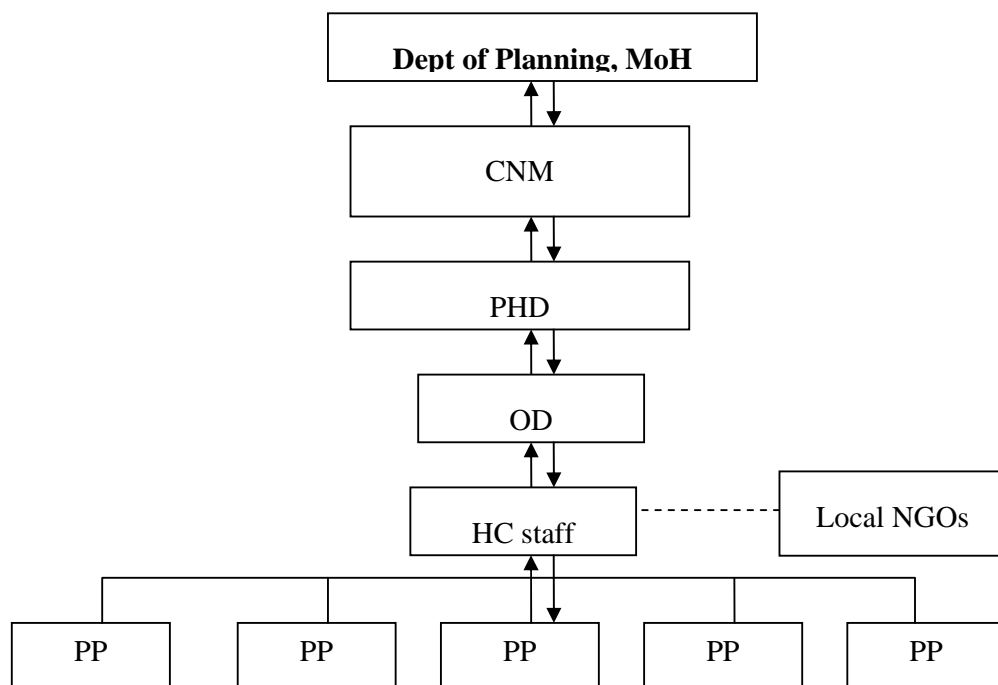
#### *Data collection methodology*

- Register containing recording forms will be provided in duplicate to all the trained PPs in each province
- Age, gender, occupation, residence, pregnancy status, service used before admission, signs and symptoms, diagnosis, drugs used, type of care, outcome of treatment and duration will be filled for every malaria patient handled by the PP
- The registers will be exchanged between the HC staff and the PPs during the monthly interactions proposed at the HC level

#### *Data analysis methodology*

- Double entry method
- Data will be first entered into Microsoft Excel for windows
- Analysis will be done on SPSS version 12.0.1
- All data will be presented in percentages and in the form of tables and charts.
- Analyzed data and interpretations will be presented at the quarterly and annual review meetings

Figure 13 : Proposed flow of malaria information recorded by private providers.



#### F. Summarized M&E Plan

A summarized M&E plan clearly depicting the key indicators, baseline information, intended results/targets, data sources and frequency of data collection is illustrated in Tables 14 and 15 to serve as an indicative tool.

**NMCP's Strategic Plan 2006-2010**

**Table 14: Goal and Impact Indicators for the Strategic Plan Period (2006-2010)**

| Goal over five years   |          |      |          |                      |               |               |               |                    |   |
|--|----------|------|----------|----------------------|---------------|---------------|---------------|--------------------|---|
| To reduce malaria related mortality by 50% and morbidity by 30%, among the general population in the Kingdom of Cambodia within five years through the implementation of a comprehensive national malaria control strategy |          |      |          |                      |               |               |               |                    |   |
| Impact indicator   | Baseline |      |          | Year 1 target        | Year 2 target | Year 3 target | Year 4 target | Year 5 target      | Source and comments   |
|  | Value    | Year | Source   |                      |               |               |               |                    |   |
| Malaria mortality rate /100,000 population   | 2.8      | 2004 | HIS      | 2.6                  | 2.4           | 2.1           | 1.8           | 1.40               | HIS   |
| Number of cases treated in the public sector per 1000 population (proxy for incidence rate)  | 7.5      | 2004 | HIS      | 7.4                  | 7.3           | 7.2           | 7.1           | 7.00               | HIS   |
| Number of cases treated in the private sector per 1000 population  | FYD      | 2006 | PSMIS    | FYD                  | >FYD          |               |               | < SYD              | PSMIS. The cases are expected to increase from year 1 (coverage in 4 provinces) to year 2 (complete coverage in the targeted 12 malarious provinces) and with improved services, number is expected to decline by year 5. |
| Proportion of severe malaria cases among the total confirmed malaria cases reported in the country from the public health facilities   | 6.22%    | 2004 | HIS      | <6.22%               | <FYD          | <SYD          | <TYD          | <FoYD              | HIS   |
| Case fatality rate among severe cases in referral hospitals  | 9.1%     | 2004 | HIS      | 8.8%                 | 8.5%          | 8.2%          | 7.9%          | 7.6%               | HIS   |
| Reduction in malaria related morbidity by 70% in the additional hyper endemic villages as reported by case detection   | FYD      | 2006 | VMW unit | Baseline established |               |               |               | Baseline minus 70% | VMW Project   |
| Reduction in under-five mortality rate in 6 malaria hyper endemic provinces by 10% as compared to 2000 data.   | TBD      | 2005 | CDHS     |                      |               |               |               | Baseline minus 10% | CDHS survey on going in 2005, next expected before 2010   |
| Malaria mortality rate /100,000 population   | 2.8      | 2004 | HIS      | 2.6                  | 2.4           | 2.1           | 1.8           | 1.40               | HIS   |
| Number of cases treated in the public sector per 1000 population (proxy for incidence rate)  | 7.5      | 2004 | HIS      | 7.4                  | 7.3           | 7.2           | 7.1           | 7.00               | HIS   |

Note: FYD=First Year Data, SYD=Second Year Data, TYD= third Year Data, FoYD= Fourth Year Data

HIS=Health Information System, PSMIS=Private Sector Malaria Information System, TBD= To be done, CDHS= Cambodia Demographic and Health Survey

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**Table 15: Objectives, Service Delivery Areas and Coverage Indicators for the Strategic Plan Period (2006-2010)**

| Objective No. | Objective and Service delivery area  | Indicator description  | Baseline   |      | Year 1 target                                   | Year 2 target   | Year 3 target | Year 4 target | Year 5 target | Data source                 | Frequency of data collection                           |
|---------------|--|--|------------|------|---|---|---------------|---------------|---------------|-----------------------------|--|
|               |  |  | Value      | Year |   |   |               |               |               |                             |  |
| 1             | To significantly increase community awareness and care-taking practices on malaria prevention and control with promotion of proper health seeking behavior in malaria endemic areas in Cambodia. |  |            |      |   |   |               |               |               |                             |  |
|               | 1. Behavioral Change Communication (BCC) — Community Outreach (VHV) (CNM & NGOs)   | Number of VHVs trained   |            |      | 14  | 14  | 14            | 14            | 14            | Activity Reports            | Quarterly  |
|               |  | Number of VHV/FBC members attending monthly meetings in 13 provinces                 |            |      | 1800  | 1800  | 1800          | 1800          | 1800          | Minutes of Meetings         | Quarterly  |
|               |  | No. of IEC officers and health education trainers trained/ retrained in BCC training | 0          |      | 89  | 12  |               |               |               | Training Reports            | Quarterly  |
|               | 1. Behavioral Change Communication (BCC) — Community Outreach (School Health) (MoEYS & NGOs)   | No. of school teachers & pupils trained and No. of schools imparting SHE             |            |      | 2020 teachers<br>465,416 pupils<br>1136 schools | 2831S.T<br>eachers<br>717,993 pupils<br>1617sch<br>ools |               |               |               | Training & Activity Reports | Quarterly  |
|               | 1. Behavioral Change Communication (BCC) — Community Outreach (Child-to-child) (HU)  | Number of peers trained per year   | 0          | 2005 | 100   | 100   | N/A           | N/A           | N/A           |                             | Quarterly  |
|               |  | Number of villages covered per year with CTC education                               | 0          | 2005 | 25 villages                                     | 25 villages   | N/A           | N/A           | N/A           |                             | Quarterly  |
|               | 1. Behavioral Change Communication (BCC) — Community Outreach (Community Theatre) (HU)   | Number of Community Theatre performances   | 0          | 2005 | 30  | 30  | N/A           | N/A           | N/A           |                             | Quarterly  |
|               |  | % of monthly and quarterly progress reports submitted                                |            |      | 100%  | 100%  | N/A           | N/A           | N/A           |                             | Monthly & quarterly                                    |
|               | 2. Behavioral Change Communication (BCC) — Mass Media-Radio spots and radio programming (WMC)  | Number of people who listen to WMC programs about malaria                            | WMC<br>BSD | 2006 |   |   | increase      | N/A           | N/A           |                             | Baseline Survey to be undertaken in first half of 2006 |
|               |  | Use of insecticide treated mosquito nets among people targeted by WMC programming    | WMC<br>BSD | 2006 |   |   | increase      | N/A           | N/A           |                             | Baseline Survey to be undertaken in first half of 2006 |
|               |  | % seeking treatment from trained provider within 48 hours of developing a fever      |            |      | 50%   |   |               |               |               |                             |  |

**NMCP's Strategic Plan 2006-2010**

|          |   |   |                              |      |         |        |                      |         |     |        |  |
|----------|---|---|------------------------------|------|---------|--------|----------------------|---------|-----|--------|--|
|          |   | % target population who can explain how malaria is transmitted  | WMC FYD                      | 2006 | 50%     | 60%    | 70%                  | N/A     | N/A |        | Annually   |
|          |   | % target population using treated mosquito nets/insecticide correctly   | FYD                          | 2006 | 30%     | 40%    | 50%                  | N/A     | N/A |        | Annually   |
|          |   | % of mothers & care givers who can recognize signs & symptoms of danger in a child under 5  | BSD                          | 2006 | 50%     | 60%    | 70%                  | N/A     | N/A |        | Annually   |
|          |   | % seeking treatment from trained provider   | BSD                          | 2006 | 50%     | 60%    | 70%                  | N/A     | N/A |        | Annually   |
| <b>2</b> | <i>To improve access to preventive measures that protect the population at risk, with a focus on complete coverage for bed net distribution and re-treatment in targeted malaria endemic areas, employing an effective community based approach.</i>  |   |                              |      |         |        |                      |         |     |        |  |
|          | 1. Insecticide-Treated Nets (ITN) (CNM)   | % of population at risk sleeping under Long Lasting Insecticide Mosquito Nets(LLIMNs) the previous night, measured during peak malaria transmission season                                      | Mid term evaluation (year 3) | 2008 |         |        | Baseline established |         |     | 85%    | Twice, once at mid- term and secondly at end of program evaluation |
|          |   | % of families living in endemic areas that have sufficient LLIMNs   | Mid term evaluation (year 3) | 2008 |         |        | Baseline established |         |     | 85%    | Twice, once at mid-term and secondly at end of program evaluation  |
|          |   | Number of pregnant mothers receiving LLIMNs at their 1 <sup>st</sup> antenatal contact in malaria endemic areas   | FYD                          | 2006 | 8,050   | 3810   | Round 4              | 8,050   |     | 3810   | Monthly submission, quarterly and annual cumulation                |
|          |   | Number of LLIMNs procured and distributed (Public Sector)   | 120,000 (Round 4)            | 2005 | 135,608 | 70,890 | Round 4              | 135,608 |     | 70,890 | Quarterly submission & Annual cumulation                           |
| <b>3</b> | <i>To increase access to early diagnosis and treatment (EDAT) for malaria throughout the country by making dipstick diagnosis and pre-packaged combination therapy available everywhere by means of a three pronged approach involving: conventional public sector channels; emergency EDAT delivered through a network of village malaria workers in the most remote and inaccessible malaria hotspots; and socially marketed products distributed through the private sector.</i> |   |                              |      |         |        |                      |         |     |        |  |
|          | 1. Case Detection, and Prompt effective antimalarial treatment& recording malaria information hyper endemic areas (CNM)   | Mean % of target population (with a 95% confidence interval) specifying VMW teams as the first choice for diagnosis and treatment in the event of developing a fever in additional 100 villages | FYD                          | 2006 | FYD     | >FYD   | >SYD                 | >TYD    |     | >FoYD  | Annual survey by VMW unit  |
|          |   | % of patients with simple malaria receiving correct diagnosis and treatment/referral from VMWs in additional 100 villages   | FYD                          | 2006 | FYD     | >FYD   | >SYD                 | >TYD    |     | >FoYD  | Quarterly supervision data compiled annually by VMW unit           |
|          |   | Cumulative No. of hyper endemic villages with trained (in malaria,  | 300*                         | 2005 | 400     | 400    | 400                  | 400     |     | 400    | Quarterly reports by VMW unit                                      |

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|  |   |   |                               |                |         |         |      |      |  |      |   |
|--|---|---|-------------------------------|----------------|---------|---------|------|------|--|------|---|
|  |   | diarrhea and ARI) and equipped male-female VMW teams  |                               |                |         |         |      |      |  |      |   |
|  |   | Proportion of HCs implementing IMCI in the VMW covered areas  | 35% (90/258) in VMW provinces | 2004           | 50%     | 90%     | 100% | 100% |  | 100% | Quarterly reports by VMW unit   |
|  | 2. Case Detection, and Prompt effective antimalarial treatment& recording malaria information– public health facilities (CNM) |   |                               |                |         |         |      |      |  |      |   |
|  | 3. Case Detection, and Prompt effective antimalarial treatment& recording malaria information – private sector (CNM)          | % of targeted provinces fully covered with trained private providers (PPs) in place<br>(Total target provinces=12)  | FYD                           | 2006           | 33%     | 100%    | 100% | 100% |  | 100% | Quarterly collection, Annual cumulation by CNM                                      |
|  |   | % PPs able to recognize signs and symptoms of danger of a febrile disease in a child < 5 years and immediately referring them to fully equipped hospitals | BSD                           | 2006           | 50%     |         | 70%  |      |  | 90%  | Baseline in 2006<br>Midterm evaluation in 2008<br>End of program evaluation in 2010 |
|  |   | % PPs able to confirm malaria diagnosis according to national policy  | BSD                           | 2006           | 20%     |         | 60%  |      |  | 80%  | As above  |
|  |   | % patients with uncomplicated malaria treated correctly according to national treatment guidelines by PPs within two days of onset of symptoms            | BSD                           | 2006           | 20%     |         | 60%  |      |  | 80%  | As above  |
|  |   | No. of PPs trained in malaria diagnosis, treatment and record maintenance by end of years 1 and 2 and thereafter  | 199                           | 2005           | 700     | 2400    | 2400 | 2400 |  | 2400 | Quarterly reporting, annual cumulation  |
|  |   | No. of PPs regularly reporting on the malaria services that they provide  | 199                           | 2005           | 700     | 2400    | 2400 | 2400 |  | 2400 | As above  |
|  |   | % targeted PPs regularly and correctly recording malaria information as observed during supervision visits  | <5%                           | 2005           | 10%     | 20%     | 40%  | 60%  |  | 80%  | Quarterly reporting, annual cumulation  |
|  |   | No. of supervision visits made to the provinces and private provider facilities   | FYD                           | 2006           | 16      | 48      | 48   | 48   |  | 48   | As above  |
|  | 4. Prompt effective antimalarial treatment through social marketing in the private sector(PSI)                                | Number of RDT procured  | TBD                           | Stock from GF2 | 324,000 | 324,000 | N/A  | N/A  |  | N/A  | Ongoing   |

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|  |   |  |          |                                   |         |          |                     |           |  |           |   |
|--|---|--|----------|-----------------------------------|---------|----------|---------------------|-----------|--|-----------|---|
|  |   |  |          | exhausted Dec 2006                |         |          |                     |           |  |           |   |
|  |   | Number of ACT procured   | TBD      | Stock from GF2 exhausted Dec 2006 | 250,000 | 250,000  | N/A                 | N/A       |  | N/A       | Ongoing   |
|  |   | Number of RDT sales  | TBD      | 2006                              | N/A     | 290,000  | 290,000             | N/A       |  | N/A       | Monthly Reports   |
|  |   | Number of ACT sales  | TBD      | 2006                              | N/A     | 225,000  | 225,000             | N/A       |  | N/A       | Monthly reports   |
|  |   | Increased percentage of Private Providers that know correct diagnosis procedure and correct (MoH approved) malaria treatment | TBD      | 2006                              | TBD     | TBD      | N/A                 | N/A       |  | N/A       | Years 1 and 2   |
|  |   | Number of PMS/ODS trained as trainers in PSI malaria products  | 0        | 2006                              | N/A     | 52       | N/A                 | N/A       |  | N/A       | Ad Hoc  |
|  |   | Number of Non Qualified Health Service Providers trained by PSI  | TBD      | 2006                              | N/A     | 335      | 335                 | N/A       |  | N/A       | Ad Hoc  |
|  |   | Number of NGOs trained in social marketing   | TBD      | 2006                              | N/A     | 15       | 15 (incl refresher) | N/A       |  | N/A       | Ad hoc  |
|  | 5. Anti malarial drug quality assurance (CNM) | Number and cumulative % of trainees who gain skills in using Thin Layer Chromatographic (TLC) and disintegration test        | 12 (16%) | 2003                              | 21(30%) | 24 (60%) | 27 (100%)           | 27 (100%) |  | 27 (100%) | Once of the end of training course                              |
|  |   | Number of private providers facilities which have been visited for collection of drug samples                                | 171      | 2003                              | 180     | 260      | 350                 | 370       |  | 370       | Quarterly reporting by PHDs and annual cumulation report by CNM |
|  |   | Number of drug outlets visited by the Provincial Drug Management Committee and stakeholders                                  | FYD      | 2006                              | 85      | 120      | 160                 | 170       |  | 170       | Quarterly reporting and annual cumulation report by PHD         |
|  | 6. Monitoring of Drug Resistance (IPC)        | Number of tested drugs   | 4        | 2004                              | 6       | 6        | 8                   | NA        |  | NA        | Annual  |
|  |   | Number of isolates tested in vitro   | 400      | 2004                              | 400     | 500      | 500                 | NA        |  | NA        | Annual  |
|  |   | Number of personnel trained and monitored  | 0        | 2004                              | 2       | 2        | 2                   | NA        |  | NA        | Annual  |

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|          |   |   |                      |      |                                  |                                       |   |   |  |   |  |
|----------|---|---|----------------------|------|----------------------------------|---------------------------------------|---|---|--|---|--|
|          |   | Number of isolates genotyped in the NLMR  | 0                    | 2004 | 0                                | 200                                   | 400   | NA                                      |  | NA                                      | Annual   |
| <b>4</b> | <i>To strengthen the institutional capacity of the national malaria control program at central, provincial, operational district and commune levels</i> |   |                      |      |                                  |                                       |   |   |  |   |  |
|          | 1. Coordination and Partnership Development (CNM)   | Long-term Strategic Plan for 2011-2015 finalized  | Str.plan 2006-2010   | 2005 |                                  |                                       |   |   |  | Strategic plan finalized                | Once in 2010 by CNM                                      |
|          |   | % of provinces & operational districts with appropriate & realistic decentralized operational plans | Year 5, round 2 data | 2008 |                                  |                                       |   | = or >Yr 5 Round 2 data                 |  | = or >Yr 5 Round 2 data                 | Annual desk review by technical bureau, CNM              |
|          | 2. Human Resources (CNM)  | Required additional staff & long-term TA recruited and in position                                  | 0                    | 2005 | Addl. Staff & TA in position     |                                       |   |   |  |   | Once- upon completion of recruitment & selection process |
|          | 3. Monitoring and Evaluation (CNM)  | % of supervised public health facilities correctly recording and reporting Malaria data             | Year 5, round 2 data | 2008 |                                  |                                       |   | = or >Yr 5 Round 2 data                 |  | = or > yrs 5 round 2 data               | Annual desk review by technical bureau, CNM              |
|          |   | Establishment and operationalization of PSMIS   | Pilot PSMIS set up   | 2005 | PSMIS established in 4 provinces | PSMIS operationalized in 12 provinces | PSMIS fully operationalized in 12 provinces | PSMIS continues to function efficiently |  | PSMIS continues to function efficiently | Annual   |

*Note:* NLMR= National Laboratory on Molecular Resistance, PSMIS=Private Sector Malaria Information System, N.A.=Not Applicable

\* 300 Villages already covered with male-female VMW teams, trained in malaria diagnosis using RDTs and treatment with ACTs

## Chapter 6 Financial Costs, Budgets and Gaps

### A. Current and planned expenditures from all relevant sources (domestic and external)

The Ministry of Health has in recent years increased its spending on malaria control and on average spends US \$500,000 per year, mainly covering procurement of diagnostic dipsticks, drugs, bednets, insecticide, health promotional material such as T-shirts and caps, supervision costs, government staff salaries, establishment and maintenance charges, POL, etc. The ongoing Health Sector Support Project (HSSP) (2003-2008) co-funded by WB/DFID/ADB has earmarked a total of 3.5 million US\$ for malaria control activities (mainly operational costs and some procurement costs plus technical assistance and operational research). USAID supports the national malaria control program through WHO with an average annual allocation of US\$ 500,000. Commitments have been made particularly for supporting antimalarial drug component, short-term TA and some capacity building activities.

The key funding agencies and their committed/approved contributions may be summarized as follows:

Table 16: Contributions from key funding agencies to the  
Cambodian National Malaria Control Program

| Name of Agency        | Type of Agency                                     | Main thrust areas of support   | Funds committed (US \$)                                 |
|-----------------------|--|--|---|
| Ministry of Health    | Government   | Overall policy guidance and financing of the core component of the National Malaria Control Program (NMCP)   | US \$500,000 per year                                   |
| World Bank            | Multilateral                                       | Costs for partial procurement of drugs and commodities such as bed nets, insecticide and diagnostic dipsticks , limited civil works, key control operations, monitoring and supervision, training and capacity building as part of Health Sector Support Project   | US \$2,300,000 from 2003-2008                           |
| DFID                  | Bilateral  | TA and Capacity building of NMCP as part of Health Sector Support Project  | US \$1,200,000 from 2003-2008                           |
| WHO/USAID             | Bilateral aid provided through Multilateral Agency | TA, capacity building, drug research, monitoring drug use and resistance, monitoring IBN use and entomological evaluation and community-based malaria BCC.USAID support provided partly through WHO to CNM and partly directly to NGOs.  | US \$1,400,000 per year for malaria and dengue control. |
| Global Fund (Round 2) | Multi-country global initiative                    | Costs for partial procurement of drugs and commodities such as bed nets, insecticide and diagnostic dipsticks , laboratory reagents, human resources, key control operations, including IEC activities, monitoring and evaluation, training and capacity building as part of Health Sector Support Project | US \$ 9.9 million from 2004-2008                        |
| Global Fund (Round 4) | Multi-country global initiative                    | Scaling up BCC interventions replacing conventional ITNs with LLIMNs in most inaccessible and hyperendemic villages, social marketing of LLIMNs and ITKs in other areas and TA to partners.  | US \$9.8 million from 2004-2008                         |
| Govt. of Japan/WHO    | Bilateral aid provided through Multilateral Agency | TA through WHO   | US \$115,000 per year committed on year to year basis   |

In addition to the above, Health Unlimited, one of the key NGO partners assisting in the implementation of the NMCP, has a commitment of 160,000.00 US Dollars from DFID & EC support for the period, 2002-2006. All the committed amounts have been entered into Table 16 below.

## **B. Estimate of the costs of meeting overall (national) goals and objectives**

The cost of meeting the overall national goal and strategic objectives has been estimated to be \$16,508,652 for 2006, \$10,029,043 for 2007, \$14,773,405 for 2008, \$9,034,994 for 2009 and \$6,771,298 for 2010. The resource needs for the NMCP were originally estimated during the preparation of the previous Five Year Strategic Master Plan (costed national strategies) drafted by the National Center for Parasitology, Entomology and Malaria Control (CNM). This document formed the basis for seeking support from World Bank, DFID, WHO, USAID, Japanese Government as well as from the Global Fund Rounds Two and Four. However, the public health sector has been able to meet the needs of only around a fifth of the malaria-affected people in the country with the rest of the people seeking treatment and care through private and non-formal sectors. This obviously points to the need for a greater involvement of the private and voluntary sector in malaria control operations. The opportunity provided by Global Fund has meant that the NMCP could invite the NGO partners working in the country to join the partnership in the battle against malaria. With each round of call issued by the Global Fund, there has been increasing interest among the NGO partners and other related Government Ministries and departments to join the partnership. Hence the needs are still evolving, and what has been presented in the above table is the needs picture as it emerges today (specifically estimated for the GFATM Round 5 proposal), based on:

1. The burden of malaria disease and death in the country
2. The strategic priorities for malaria control in the country
3. The absorptive capacity of the country
4. The technical and management capacity of the different partners involved (totally 15 till date)

The estimates of the needs have been made through the creation of Task Forces within the RBM Technical Advisory Group and involving prospective partners in malaria control and the expatriate malaria advisors available within CNM and WHO. Each Task Force mapped out the priorities and interventions needed in different parts of the country, reviewed which partner was in the best position to deliver the services in different priority provinces, and estimated the costs using a standardized unit costs approach as far as possible.

The needs have been categorized into two groups: those that need to be addressed immediately, utilizing the opportunity provided by GFATM Round 5 but keeping in mind the absorptive capacity of the country in general and the technical and managerial capacity of the key partners involved in the response to the disease; and those needs which could be addressed in the intermediate term by approaching other donors as well as submitting proposals at future GFATM Rounds. Thus, for example, total replacement of conventional ITNs with LLIMNs in all the current risk categories (which need to be reviewed after the consultants' submission of final report of Round 2 baseline survey in late June 2005) in the country is expected to cost around 13 million US\$. NMCP is seeking funds only to ensure complete coverage of Risk Category 1 through this proposal. Similarly, although NMCP would have ideally desired to scale up its innovative private sector malaria information strategy to cover all 20 provinces in which malaria cases are routinely handled, it proposes to cover only 12 most endemic provinces with Round 5 support. PSI's social marketing strategy has proved so successful that based on current demands for its products, it expects to run out of funds for procuring the requirements by end of year 3 through GFATM Round 3 Support. Thus although it needs to procure additional quantities for years 4 and 5 of Round 2 program, it has proposed a budget for only one year's requirement of social marketed products. Some of the Round 4 NGO and related Ministry partners initially desired to scale

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up their activities through Round 5 support; however as they are yet to begin implementation of Round 4 program activities, they have agreed to defer their proposals to the next round of GFATM. Hence, only the group of needs that could be met immediately with existing capacity in the country was presented to the GFATM Round 5.

**Table 17: Calculation of the gaps between the estimated costs and current & planned expenditures for NMCP**

|   | Financial contributions in US\$ |              |              |               |               |               |              |
|---|---------------------------------|--------------|--------------|---------------|---------------|---------------|--------------|
|   | 2004                            | 2005         | 2006         | 2007          | 2008          | 2009          | 2010         |
| Domestic (A)<br>MoH   | 475,000                         | 500,000      | 500,000      | 500,000       | 500,000       | 500,000       | 500,000      |
| External (B)<br>Total   | 3070265.32                      | 7902185.84   | 5410539      | 4692037       | 3920012       | 1638840       | 500000       |
| External source 1<br>(WB/DFID through HSSP)                       | 972,928.66                      | 595,250.50   | 611,808      | 793,808       | 48,1148       | N.A.          | N.A.         |
| External source 2<br>(USAID/WHO)                                  | 500,000                         | 500,000      | 500,000      | 500,000       | 500,000       | 500,000       | 500,000      |
| External source 2<br>(DFID & EC through HU)                       | 40000                           | 20000        | 20000        | N.A.          | N.A.          | N.A.          | N.A.         |
| External source 3<br>(Govt. of Japan/WHO)                         | 115,000                         | 115,000      |              |               |               |               |              |
| External source 4<br>(GFATM Round 2 Program)                      | 1,442,336.66                    | 3,570,925.34 | 2,158,499    | 2,059,439     | 767,171       | N.A.          | N.A.         |
| External source 5<br>(GFATM Round 4 Program)                      |                                 | 3,101,010    | 2,120,232    | 1,338,790     | 2,171,693     | 1,138,840     | N.A.         |
| Total resources available (A+B)                                   | 3,545,265.32                    | 8,402,185.84 | 5,910,539    | 5,192,037     | 4,420,012     | 2,138,840     | 1,000,000    |
| Total need (C)  | 3545265.3                       | 8402185.8    | 16,508,652   | 10,029,043    | 14,773,405    | 9,034,994     | 6,771,298    |
| Unmet need (D)=(C)-(A+B)  | 0.00                            | 0.00         | 10,598,113   | 4,837,006     | 10,353,393    | 6,896,154     | 5,771,298    |
| Unmet need proposed to be addressed through GFATM R 5 support (E) | 0.00                            | 0.00         | 3,594,467.00 | 2,150,152.071 | 1,281,817.361 | 2,167,605.476 | 1,832,263.11 |
| Persisting funding gap (F)=D-E                                    | 0                               | 0            | 7,003,646    | 2,686,853.93  | 9071575.64    | 4728548.52    | 3939034.89   |

Note: N.A. = Not available

1. USAID and WHO should agree on the budget every year, since the budget is under USAID umbrella fund that includes all the support through WHO.
2. No commitment from Govt. of Japan/WHO for the period 2006 onwards. A proposal needs to be submitted and approved every year.

The unmet need (obtained by subtracting the available resources from the total needs) has been estimated to be \$10,598,113 for 2006, \$4,837,006 for 2007, \$10,353,393 for 2008, \$6,896,154 for 2009 and \$5,771,298 for 2010, as shown in Table 16. The unmet need proposed to be addressed through GFATM R 5 support has been calculated to be \$3,594,467.00 for 2006, \$2,150,152.10 for 2007, \$1,281,817.40 for 2008, \$2,167,605.476 for 2009 and \$1,832,263.10 for 2010, as shown in Table 17. The funding gap still persisting after GFATM R 5 submission and which will need to be addressed through future GFATM rounds and/or through other funding agencies has been projected to be \$7,003,646 for 2006, \$2,686,853.93 for 2007, \$9071575.64 for 2008, \$4728548.52 for 2009 and \$3939034.89 for 2010, as shown in Table 17.

A sum of US\$ 18,661,428 is expected to be available for the years 2006 to 2010 (including from GFATM Rounds 2 and 4). This works out to an average of US\$3,732,285/year and this amount when divided by the at-risk population of 2 million yields a per capita expenditure of US\$1.9. When the GFATM Round 5 proposal total is added to the current committed amount, it works out to US\$ 5,737,546/year or a per capita expenditure of 2.96 US\$. If the persisting funding gap is addressed, and thus the total needs amounting to US\$ 58,038,538 over the five year period from 2006-2010 are met, this will work out to an average of US\$ 11607707.60 per annum. This will imply a per capita expenditure of 5.8 US\$ per risk person. However it must be remembered that the concept of high risk is employed only when estimating prevention and promotion needs of the malaria program. However curative services (through both public and private health facilities) need to be provided in 20 of the country's 24 provinces in which malaria is reported. Hence the additional per capita expenditure is considered essential.

**Specific resource needs and financial gaps at CNM:**

CNM has carried out a detailed activity plan (see Annex 1) for the next five years (2006-2010), clearly identifying the resource needs and the financial gaps. CNM would require US \$ 30, 607,763 to implement all the activities (through provincial, operational district and commune level actions) pertaining to the strategies that it is committed to pursue over the next five years for effectively executing its share of malaria . However, there is a financial gap of US \$ 8, 650,906 that CNM needs to still mobilize by approaching the Royal Government and donor agencies including future Global Fund rounds.